



FRIDAY, NOVEMBER 22, 1878.

Contributions.

The Paris Exhibition—Locomotive Appliances and Axle-Boxes in the Austrian Exhibit.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Among the various exhibits of the Austrian State Railroad Company, besides those already described in my former letters, are some that will be of special interest to your readers. I would call the attention of master mechanics to an instrument for measuring the length and the squareness of locomotive cranks, whose value will be appreciated by all who, reading the reports of accidents in the *Railroad Gazette*, have noticed how frequently the breaking of con-

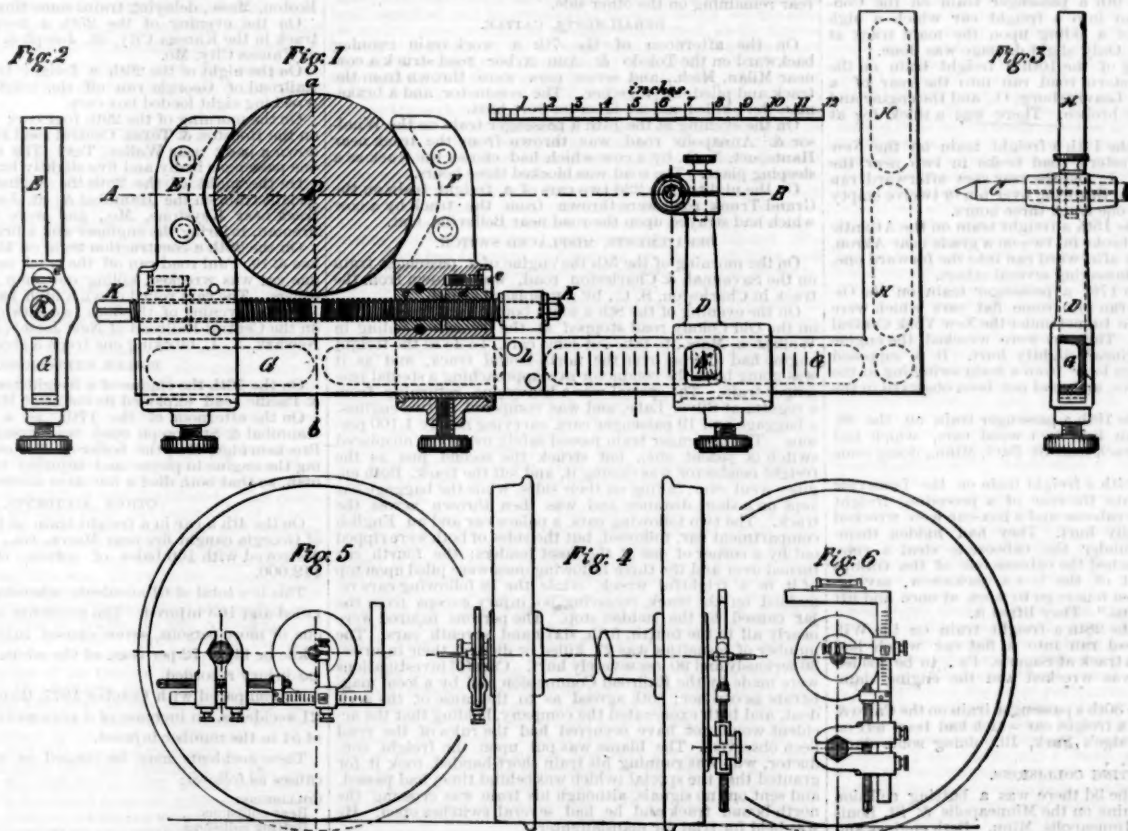
from the arm *G G* as is the centre of the crank-pin. The head *D* has a scale of the tenths of millimeters at *S*, enabling one to read the slightest differences in the lengths of the cranks. The application of this instrument for measuring the length of cranks will be readily understood, and to measure their squareness, the operation is as follows: In fig. 4 is represented one pair of wheels, and figs. 5 and 6 are side views of the respective wheels. First, attach the instrument to one wheel, grasping firmly the crank-pin with the heads, *E, F*, (fig. 1); place the point *C* (fig. 3) exactly in the centre of the axle, and by means of an air-level, placed on the arm *G G* of the square, make the centre line of the crank truly horizontal; attach then the instrument to the other wheel, and see that the air-level, placed on the shorter arm of the square (fig. 6), shows horizontal, and the cranks will be square. Reading the scale in each case the exact length of cranks can also be determined.

In my former description of an apparatus for reducing the wear of wheel-flanges by lubrication, I omitted to mention that this company has been using, for many years, another process for accomplishing the same object. It exhibits a fraction of a locomotive tire, with that part of the flange

thus saved. Out of the total number of 13,470 cars, 10,109 are provided with these boxes. They are inspected every four months on cars of express trains, every 12 months on other passenger cars, and every 18 months on freight cars—making an exception if a car should have an unusually large mileage. They are lubricated periodically; every month on passenger, baggage and mail cars, and every two months on freight cars. The lubricating matter consists of a mixture of 60 per cent. of colza oil (vegetable oil, made of a species of cabbage seed), with 40 per cent. of mineral oil, for passenger cars; and 20 per cent. of colza with 80 per cent. of mineral oil, for freight cars. This mixture is, however, used only when the boxes are inspected, and for the periodical lubrication only mineral oil is used. The company claims great economy in using these boxes over the old style, and gives a statement, which changed to our measurement gives the quantity consumed per axle, per 1,000 miles, as follows:

In 1857.....	2.6111 lbs.
" 1862.....	1.6258 "
" 1867.....	1.1303 "
" 1872.....	0.9770 "
" 1877.....	0.9230 "

As these figures are deduced from the total quantities con-



APPARATUS FOR MEASUREMENT OF THE LENGTH AND SQUARENESS OF CRANKS ON LOCOMOTIVE AXLES.

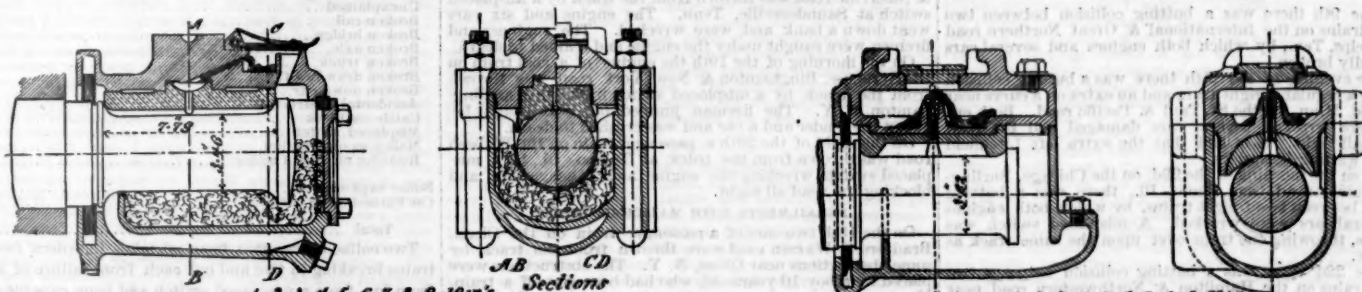


Fig. 7. PAGET CAR AXLE-BOX.

Fig. 8. L. BECKER'S CAR AXLE-BOX.

necting-rods occurs. It is the parallel rod which usually gives way, and the cause of it cannot be ascribed to the poor quality of metal, it being known that the parallel rod is usually made in proportion to the strain to which it is subjected, heavier than the main connecting rod. If, however, the cranks of two coupled wheels are of different lengths, or if the centres of their crank-pins do not pass simultaneously the dead centres, the coupling-rod will be subjected to strains, often so much greater than those they were intended for that the breakage of the rod or a crank-pin must occur. It is, therefore, of the utmost importance to discover in time the existence of these causes, and this can be accomplished by the simple apparatus exhibited at Paris, and illustrated in the engravings figs. 1 to 6. It consists of a strong cast-steel square *G H*, with two sliding heads *E F* on its longest arm, which can be moved toward or from the centre of a crank-pin *P* by means of a left and right-hand screw, *K K*. The nuts in each of the sliding heads are made in two parts *c d* (shown in section on the head *F*) to enable any play caused by the wear to be taken up by means of the little screw *e*. The centre line *a b* of the crank-pin, grasped by the heads, corresponds with the zero line of a millimeter scale on the arm *G G*. A third head *D* is made to slide freely on the arms *G G*, but can be fastened by a thumb-screw below; its upper end is provided with a pointed pin *C* (shown in fig. 3) whose centre is at the same distance

which is subjected to the wear hardened. This is done by means of a special furnace so arranged that the tire, with its wheel, can be placed on it and be surrounded with ignited coke on the outside. Air is blown through many holes of a ring, which surrounds the tire, acting exactly on that part of the flange which should be hardened, and when it reaches a dark-red heat, the wheel is lifted and immersed in water of about 60° Fahr. The bolts which fasten the wheel to the tire are loosened to allow expansion. The results of this process are said to be satisfactory, the life of tire being doubled.

Axle-Boxes.—The *Railroad Gazette*, not long ago, published an article on axle-boxes used in Europe, in all their different forms. The two boxes which are exhibited do not possess any novelty not contained in the above article, but as my object is to give a statement of their performance, it is also necessary to show their construction. Fig. 7 of the accompanying engravings represents a type adopted by the Austrian State Railroad Company, and known as "system Paget." The journal is oiled from the top and below, waste soaked in oil being introduced into the cavity under the journals, and oil being poured in the upper cellar, whence it is introduced under the brass by a wick, as shown in the engraving. A cover in front allows a rapid inspection of the journal. The bottom cellar collects oil, which is carried out by the centrifugal force, and which is

sumed, they comprise also oil used for the old style boxes; and this accounts for the decrease, the Paget boxes increasing in number constantly as the old ones are replaced by them until they finally entirely replace the others. To admit of an easier comparison between the performance of these boxes and those used in America, I would add that the weight per wheel of an Austrian passenger car averages about 6,200 lbs., and that of a freight car 8,500 lbs.

The other box exhibited in the Austrian department is that of Mr. L. Becker, Central Inspector of the Emperor Ferdinand Northern Railroad. There are about 72,000 of them in use. Fig. 8 represents its construction; it oils the journal from the top and below; its peculiarity is in the sucking arrangement, which consists of a thin pipe holding a cotton wick; the pipe is inserted in a cork plug, which being put in the oil-hole closes it tightly. By this arrangement the lubrication is said to be very regular. The whole apparatus is taken out, should the wick stop its action, and replaced by a new one. One man is specially employed for repairing and making new apparatus. Under the journal, in the lower cellar, are placed shavings of the lime-tree, which are preferred to cotton waste as keeping the oil cleaner.

The quantity of oil consumed per axle per 1,000 miles averaged, for the years 1870 to 1877, 1.2036 lbs. for passenger cars, 0.8850 for freight cars, and 0.9204 for the average of both. Mineral oil has been mostly used, being 89

per cent. of the total. The number of cars with hot boxes averaged during that time 16.5 per cent. of the total number of cars.

Train Accidents in October.

The following accidents are included in our record for the month of October:

REAR COLLISIONS.

Early on the morning of the 2d a freight train on the Cincinnati Southern road ran into a box-car which had been run from a siding on the main track at Nicholasville, Ky., and several cars were wrecked, blocking the road eight hours. The car had been left on a siding the night before.

Early on the morning of the 2d a coal train on the New York, Lake Erie & Western road ran into the rear of a preceding coal train near Southfield, N. Y., wrecking several cars and blocking both tracks three hours.

On the morning of the 4th a heavy passenger train, drawn by two engines, on the Grand Trunk road, ran into the rear of a freight, which was going upon a siding at Morrisburg, Ont., wrecking both engines and several cars, killing one trainman and injuring another. It is said that the brakes on the passenger train failed to work.

On the night of the 8th, near Southington, Conn., on the New Haven & Northampton road, there was a rear collision by which an engine and six freight cars were badly damaged.

On the night of the 9th a passenger train on the Connecticut River road ran into a freight car which a high wind had blown out of a siding upon the main track at Williston Mills, Mass. Only slight damage was done.

Early on the morning of the 10th a freight train on the Atlantic & Great Western road ran into the rear of a preceding freight near Leavittsburg, O., and the engine and several cars were badly broken. There was a thick fog at the time.

On the evening of the 14th a freight train on the New York, Lake Erie & Western road broke in two near the Hackensack Bridge, N. J., and the rear cars afterward ran into the forward section, throwing over ten or twelve empty box-cars and blocking one track three hours.

On the evening of the 15th a freight train on the Atlantic & Great Western road broke in two on a grade near Akron, O., and the rear section afterward ran into the forward one, wrecking one car and damaging several others.

On the evening of the 17th a passenger train on the Oswego & Syracuse road ran into some flat cars which were on the main track in the tunnel under the New York Central track in Geddes, N. Y. The cars were wrecked, the engine damaged and the engineer slightly hurt. It is supposed that the cars had broken loose from a train switching at the furnace siding just above, and had not been observed in the darkness.

On the morning of the 19th a passenger train on the St. Paul & Duluth road ran into two wood cars, which had been left on the main track near St. Paul, Minn., doing some damage.

On the night of the 24th a freight train on the Louisville & Nashville road ran into the rear of a preceding freight near Guthrie, Ky. The caboose and a box-car were wrecked and two tramps fatally hurt. They had hidden themselves in the tool-box under the caboose to steal a ride. When the trainmen reached the caboose one of the tramps coolly threw them out of the box a jackcrew, saying: "Here, some of you d--n fellows go to work at once and lift this infernal car off of us." They lifted it.

On the afternoon of the 28th a freight train on the Wilmington & Northern road ran into a flat car which had been run upon the main track at Sager's, Pa., to be loaded with logs. The car was wrecked and the engine damaged.

On the evening of the 30th a passenger train on the Cairo & St. Louis road ran into a freight car which had been left on the main track near Hodge's Park, Ill., doing some damage.

BUTTING COLLISIONS.

On the afternoon of the 3d there was a butting collision between two freight trains on the Minneapolis & St. Louis road, on a curve near Minneapolis, Minn. Both engines and several cars were damaged; a fireman jumped and broke his leg.

On the 9th there was a butting collision between two freight trains on the International & Great Northern road near Phelps, Tex., by which both engines and several cars were badly broken.

On the evening of the 15th there was a butting collision between a regular freight train and an extra on a curve near Litchfield, Minn., on the St. Paul & Pacific road. Both engines were wrecked, several cars damaged and the road blocked all night. It is said that the extra left Litchfield without waiting for orders.

Early on the morning of the 23d, on the Chicago, Burlington & Quincy road, near Plano, Ill., there was a butting collision between two freight trains, by which both engines and several cars were wrecked. A misplaced switch was the cause, throwing one train over upon the same track as the other.

On the 23d there was a butting collision between two freight trains on the Hamilton & Northwestern road near Barrie, Ont., by which both engines and several cars were wrecked and five trainmen hurt.

On the 31st, on the Grand Trunk road, near Toronto, Ont., there was a butting collision between two freight trains, by which both engines and several cars were wrecked and a brakeman hurt. A mistake in a train order is said to have been the cause.

DERAILMENT, BROKEN RAIL.

On the 23d some cars of a passenger train on the St. Louis & Southeastern road were thrown from the track by a broken rail, near Goodlettsville, Ky.

DERAILMENTS, BROKEN BRIDGE.

Late on the night of the 5th a freight train on the Texas & Pacific road went through the bridge over Blackberry Creek, near Will's Point, Tex., wrecking the engine and several cars, and two cars were burned up. The bridge had been partly burned, but the fire had gone down so as not to be seen by the engineer until too late.

On the night of the 19th a freight train on the Port Royal road broke through the bridge over the Savannah at Sand Bar Ferry, Ga. The engine and some cars were wrecked, the engineer and fireman badly hurt.

On the 23d a freight train on the Chicago, Burlington & Quincy road went through a bridge near Bushnell, Ill., doing much damage. A gang of men was at work repairing the bridge, and had taken up the track; not knowing that an extra freight was coming they did not signal it until too late.

On the evening of the 26th a bridge on the Hawley Branch of the New York, Lake Erie & Western road, near Millville, Pa., gave way under a coal train and 13 cars went down into the creek, the engine and 42 cars having passed over safely. The bridge was a wooden one of 80 feet span. It is said that its failure was caused by some of the cars jumping the track and running into one of the trusses.

DERAILMENT, BROKEN AXLE.

On the morning of the 4th an axle broke under a car in a freight train on the Lehigh Valley road, at Catasauqua, Pa., and several cars were thrown from the track. The first car caught fire and four oil cars were burned up, causing a loss estimated at \$18,000. A by-stander was badly burned. The breaking of the axle is said to have been caused by the journal heating.

DERAILMENT, BROKEN TRUCK.

On the 7th a car in a passenger train on the Waynesburg & Washington road was thrown from the track near Washington, Pa., by the breaking of a truck. The car went down the bank and was badly damaged.

DERAILMENT, BROKEN DRAW-HEAD.

On the afternoon of the 7th several cars of a coal train on the New York, Lake Erie & Western road were thrown from the track near Otisville, N. Y., by a draw-head which pulled out from one of the cars.

DERAILMENT, ACCIDENTAL OBSTRUCTION.

On the evening of the 26th the third car of a freight train on the New York, Lake Erie & Western road was thrown from the track by a brake-beam which dropped down just as the train was going upon the bridge over the Cohocton River, near Cooper's, N. Y. The car ran against the end-post of the bridge and broke it, and the bridge went down, carrying four cars with it. The couplings broke, the engine and first two cars going over safely and several cars in the rear remaining on the other side.

DERAILMENTS, CATTLE.

On the afternoon of the 7th a work-train running backward on the Toledo & Ann Arbor road struck a cow near Milan, Mich., and seven cars were thrown from the track and piled up together. The conductor and a brakeman were killed and six laborers were hurt.

On the evening of the 14th a passenger train on the Windsor & Annapolis road was thrown from the track near Hantsport, N. S., by a cow which had chosen the track as a sleeping-place. The road was blocked three hours.

On the night of the 23d two cars of a freight train on the Grand Trunk road were thrown from the track by a cow which had strayed upon the road near Belleville, Ont.

DERAILMENTS, MISPLACED SWITCH.

On the morning of the 5th the engine of a passenger train on the Savannah & Charleston road, was thrown from the track in Charleston, S. C., by a misplaced switch.

On the evening of the 8th a south-bound local freight train on the Old Colony road stopped at the Foundry Siding in Wollaston, Mass., to take out some cars. To do so the freight engine had to cross over the north-bound track, and as it was going back the conductor saw approaching a special passenger train. The special was a heavy one, returning from a regatta at Silver Lake, and was composed of two engines, a baggage and 19 passenger cars, carrying nearly 1,100 persons. The passenger train passed safely over one misplaced switch (a patent one), but struck the second just as the freight conductor was closing it, and left the track. Both engines went over, falling on their sides, while the baggage car kept on a short distance and was then thrown across the track.

The two following cars, a palace car and an English compartment car, followed, but the sides of both were ripped out by a corner of one of the upset tenders; the fourth car turned over and the three following ones were piled upon top of it in a frightful wreck, while the 12 following cars remained on the track, receiving no injury except from the jar caused by the sudden stop. The persons injured were nearly all in the fourth, fifth, sixth and seventh cars. The number of casualties was 21 killed or died of their injuries; 36 seriously and 90 less severely hurt. Careful investigations were made by the Railroad Commission and by a local magistrate as coroner; both agreed as to the cause of the accident, and both exonerated the company, holding that the accident would not have occurred had the rules of the road been observed. The blame was put upon the freight conductor, who was running his train short-handed, took it for granted that the special (which was behind time) had passed, and sent out no signals, although his train was crossing the north-bound track and he had several switches open. He was held for trial for manslaughter.

On the morning of the 9th a freight train on the Louisville & Nashville road was thrown from the track by a misplaced switch at Saundersville, Tenn. The engine and six cars went down a bank and were wrecked. The engineer and firemen were caught under the engine and scalded to death.

On the morning of the 19th the engine of a coal train on the Syracuse, Binghamton & New York road was thrown from the track by a misplaced switch in the yard at Binghamton, N. Y. The fireman jumped, but was caught between the tender and a car and was crushed to death.

On the night of the 29th a passenger train on the Wabash road was thrown from the track at Tolono, Ill., by a misplaced switch, wrecking the engine and baggage car, and blocking the road all night.

DERAILMENTS WITH MALICIOUS INTENT.

On the 13th two cars of a passenger train on the Olean, Bradford & Warren road were thrown from the track by some obstructions near Olean, N. Y. The obstructions were placed by a boy 10 years old, who had been put off a train. He was afterward arrested and sent to the House of Refuge.

On the morning of the 25th a passenger train running to the state fair grounds, was thrown from the track in Atlanta, Ga., by a misplaced switch. It was found that the bolt had been removed from the switch stand, and that the switch had probably jarred open when the train struck it.

Early on the morning of the 30th the engine of a freight train on the Shore Line Division of the New York, New Haven & Hartford road was thrown from the track near Guilford, Conn., by some ties which had been placed in a cattle-guard. Some tramps were afterward arrested on suspicion.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the morning of the 4th the engine of a local freight train on the Philadelphia, Wilmington & Baltimore road ran off the track at North East, Del., blocking the road an hour.

On the afternoon of the 4th a freight train on the Hannibal & St. Joseph road ran off the track near Brookfield, Mo., blocking the road several hours.

On the morning of the 5th as a freight train was running backward through the New York Central & Hudson River yard at East Buffalo, N. Y., the rear car jumped the track at a frog, and six others were piled up on top of it, making a bad wreck.

On the morning the 9th six cars of a freight train on the Boston & Albany road ran off the track at Cottage Farm, Mass., and three of them were badly wrecked.

On the 9th the caboose of a freight train on the Dayton, Sheridan & Grand Ronde road ran off the track and upset near Ball's, Oregon. The car was wrecked, injuring two persons fatally and four less severely.

On the afternoon of the 11th eight cars of a freight train on the St. Louis & Southeastern road ran off the track and down a high bank near Springfield, Tenn., one car running on the ties upon a trestle near by and then dropping down

into a ravine. The cars were all wrecked and a brakeman hurt; the road was blocked six hours.

On the evening of the 14th the engine and one car of an express train on the New York, Lake Erie & Western road ran off the track near Rutherford, N. J., blocking the road two hours.

On the night of the 14th, as a coal train on the Delaware, Lackawanna & Western road was being pushed on a high trestle siding in Newark, N. J., the brakes were not put on soon enough and the train struck the bumper at the end of the siding, tearing it down, and several cars went off the end of the trestle, falling into a street below. The cars were completely wrecked.

On the evening of the 15th the engine of a passenger train on the Metropolitan Elevated road ran off the track at the Rector street station in New York, delaying trains some time.

On the afternoon of the 16th a car in a freight train on the Connecticut River road broke down and went off the track near Holyoke, Mass., delaying trains some time.

On the morning of the 17th, as some coal cars on the New York Central & Hudson River road were being run on a high trestle siding at Ilion, N. Y., the train was not stopped in time and three cars went off the end of the trestle, falling 25 feet.

On the morning of the 19th a freight train on the New Jersey Midland road ran off the track at Hamburg, N. J., blocking the road three hours.

On the evening of the 22d the engine and one car of a freight train on the Eastern Railroad ran off the track in Boston, Mass., delaying trains some time.

On the evening of the 25th a freight train ran off the track in the Kansas City, St. Joseph & Council Bluffs yard at Kansas City, Mo.

On the night of the 26th a freight train on the Central Railroad of Georgia ran off the track near Macon, Ga., wrecking eight loaded box-cars.

On the morning of the 29th four cars of a passenger train on the Houston & Texas Central road ran off the track and down a bank near Waller, Tex. The cars were damaged, one passenger badly and five slightly hurt.

On the night of the 28th the engine and eight cars of a freight train on the Hannibal & St. Joseph road ran off the track near Keystone, Mo., and were wrecked, killing the fireman, injuring the engineer and a brakeman.

On the 29th a construction train on the Chicago, Milwaukee & St. Paul road ran off the track near Sheldon, Ia., and one car was wrecked, killing one man and injuring seven others. The cars rolled down a high bank.

On the evening of the 30th two cars of a passenger train on the Central Railroad of New Jersey, ran off the track in Newark, N. J., blocking one track a short time.

BOILER EXPLOSIONS.

On the 16th the engine of a freight train on the Sioux City & Pacific road exploded its boiler at Missouri Valley, Ia.

On the afternoon of the 17th, as a freight train on the Hannibal & St. Joseph road was going up a grade near Breckenridge, Mo., the boiler of the engine exploded, tearing the engine to pieces and injuring the engineer and fireman, so that both died a few days afterward.

OTHER ACCIDENTS.

On the 4th a car in a freight train on the Central Railroad of Georgia caught fire near Macon, Ga., and four cars were destroyed with 156 bales of cotton, the loss being about \$12,000.

This is a total of 61 accidents, whereby 35 persons were killed and 163 injured. Ten accidents caused the death of one or more persons, seven caused injury, but not death, while in 44, or 72 per cent. of the whole number, there was no injury recorded.

As compared with October 1877, there was a decrease of 21 accidents, an increase of 4 persons killed, and an increase of 51 in the number injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear collisions.....	13
Butting collisions.....	6
DERAILMENTS:	19
Unexplained.....	16
Broken rail.....	1
Broken bridge.....	4
Broken axle.....	1
Broken truck.....	1
Broken draw-head.....	1
Broken down car.....	1
Accidental obstruction.....	1
Cattle on track.....	3
Misplaced switch.....	6
Malicious obstruction.....	2
Running off end of siding.....	2
Boiler explosion.....	2
Car burned while running.....	1
Total.....	61

Two collisions resulted from mistakes in orders, two from trains breaking in two and one each from failure of brakes, from fog, from a misplaced switch and from cars blown out of a siding. Of the six misplaced switch derailments, one was purposely set wrong, leaving six accidents—five derailments and one collision—from carelessly misplaced points. Three derailments were maliciously caused, two by placing obstructions and one by breaking a switch. Fifteen accidents were traced directly to defects or failures of road or equipment, and probably many of the unexplained derailments could be charged to this head also. Of the four broken bridges one was burned through, one was undergoing repairs and on one the cars jumped the track, knocking down a trestle. There was also a second case of the latter kind, in which the cars ran off before reaching the bridge, but took it down with them.

Of the collisions five were between passenger and freight and 14 between freight trains; 11 derailments were of passenger and 28 of freight trains, and the three other accidents were all to freight trains. The 19 collisions killed three and injured nine persons; the 39 derailments killed 30 and injured 154, and the three other accidents killed two persons.

The month was not an unfavorable one, and the number of accidents was not great. The number of casualties also was small, if we set aside one accident. The month was notable, however, for the great accident of the year, that on the Old Colony at Wollaston, which has been the most destructive since the Ashtabula accident in December, 1876. Bad and destructive as it was, however, the Wollaston accident lacked many of the elements which will long make the

Ashtabula disaster a terrible memory; the killed were only about one-fourth the number of those at Ashtabula, and, while the number of wounded was greater, a large proportion of them were but slightly hurt. Careful investigation at Wollaston freed the management of the road from blame, but the accident should remain a warning to all trainmen of the danger of "taking risks."

For the year ending with October the record is as follows:

	No. of accidents.	Killed.	Injured.
November.....	83	23	70
December.....	66	8	26
January.....	75	23	77
February.....	67	8	31
March.....	49	5	14
April.....	46	12	35
May.....	50	13	44
June.....	56	12	58
July.....	54	7	41
August.....	75	36	108
September.....	76	22	53
October.....	61	35	163
Totals.....	758	204	740

The averages per day for the month were 1.97 accidents, 1.13 killed and 5.96 injured; for the year there were 2.08 accidents, 0.56 killed and 2.03 injured. While the daily average of accidents was below that for the year, the average number of killed for the month was twice, and that of injured 2½ times, the average for the year, the result being solely due to the large number of casualties in one accident. The average casualties per accident were, for the month 0.573 killed and 2.673 injured; for the year, 0.269 killed and 0.976 injured.

The Grand Trunk's Traffic and Policy.

The following selections from the speech of Sir Henry Tyler, President of this company, at the half-yearly meeting in London Oct. 29, when the report for the first half of this year was submitted, will be read with interest by railroad men in this country:

The half-year opened, as I have said, with good prospects. In the first month arrangements were completed for a division of the west-bound through traffic from New York and the Eastern to the Western States. They have continued with beneficial results, on the comparatively small volume of west-bound traffic. Arrangements were also made early in the year for carrying out a division of the more important east-bound traffic, and a commissioner, with his headquarters at Chicago, was appointed. Returns of traffic were made to him from March 11 to June 11, when the office was abolished. This pool, as it is called in America, never had the hearty support of the lines connected with the New York Central interest; it was, in reality, never put into operation; and, to our regret, it was abandoned. The rates, which had gradually declined from the beginning of April, were then reduced to a lower point than at any previous period. Grain was carried by rail from Chicago to New York at 15 cents per 100 lbs., and to New England at 18 cents for local consumption, and 15 cents for export. The rates by lake and canal were reduced to less than half of the above figures; and you will not be surprised to learn that we declined large quantities of traffic on the conveyance of which we could not earn a profit. There was at the same time a serious loss of local business throughout the Dominion. As an indication of the general trade of the country I may mention that the business from Montreal declined from 106,000 tons and \$467,000, in the corresponding half-year of 1874, to 78,000 tons and \$238,000 in 1878; and that the business to Montreal declined from 150,000 tons and \$603,000 in 1874, to 127,000 tons and \$382,000 in 1878. At the same time, the imports into the Dominion for the half-year decreased from \$41,000,000 in 1877, to \$37,000,000 in 1878, and the exports decreased from 25 millions to 24 millions, and the forest produce, which is a very important business in Canada, decreased from nine millions to six millions. We have, indeed, a long and disheartening list before us of decreased receipts between local stations, arising from the same if not a greater degree of stagnation of business than I have been obliged to refer to in previous half years, as regards all the staple articles of Canadian trade; and these two causes—want of local traffic and low rates for through traffic—combined with the early opening of navigation to prevent us from showing better results, and from paying a dividend on the first preference stock, as we should otherwise have done, as we did in the previous (December) half-year. And here I may observe, in passing, upon the unreasonable arguments that have been employed by those who so strongly urge that we should abandon through connections and through traffic, and confine ourselves to our legitimate business, as they are pleased to term it, as a local Canadian line. The absurdity of such arguments is at once apparent to all except those whose prejudices or interests cause them entirely to overlook the facts of the case. We have made sufficiently plain to you half-year after half-year that our local passenger traffic has for years been continually declining, in spite of all our attempts to stimulate it by running excursion trains at low fares, and by other means. There are not unfortunately the occasions to travel for business, or the money to travel for pleasure, that there were in happier times in the Dominion. The local freight business has been equally disappointing, and if we had attempted to keep the company alive upon local traffic, as some of our friends allege to be feasible, and our rivals naturally desire, it would have been impossible to maintain the credit of the company. Such propositions are simply ludicrous at a time when local trade is so bad, and their tendency is mischievous in tending to discourage our officers who are doing all they can, and to encourage our rivals who would, of course, be glad enough to see them carried into effect. If it is agreeable to you, I should like to take this opportunity of explaining generally, and without going into details, which it is undesirable to discuss in public, some of the reasons for the difference in cost to the company of conveying through and local traffic; to give you an idea of the measure of economy that could be effected by relinquishing portions of the whole of the through traffic, and to refer to the principles by which, after careful consideration, we are guided in determining whether, and down to what point, through traffic is profitable or otherwise. The systems of working, and the descriptions and requirements of the traffic, are in many respects different in America from what they are in this country. For the present purpose the difference between our through and our local traffic, though both are subject of course to numerous variations and contingencies, may be roughly defined as follows: The through traffic, which is, so to speak, a wholesale business, passes in streams over the line, in full car-loads and full train-loads, without requiring, as regards a large proportion of it, to be interfered with en route; while the local traffic, which is more like a retail business, has to be handled at stations or sidings, requires warehousing or carting or terminal work, and is picked up by local or mixed trains, which cannot be always fully loaded, and can-

not always be carried in fully loaded cars. As regards by far the greater portion of the through traffic, no expense is incurred for portage, no warehouse accommodation is required, scarcely any expenditure is incurred at stations, and only a portion of the charges of yardmen or of custom-house work at the frontier stations can be debited to it. So long as the line is worked for passenger trains and local freight traffic, stations and signals must be maintained, and the service of the railway must be properly provided for in all respects, and these could not be materially reduced by the discontinuance of the through traffic. As regards the train service itself, the same number of hands is employed with through as with local trains, but while more fuel is consumed per mile of running in the ratio of the load hauled with the through trains than with some of the local trains, the latter are more subject to detention, and are longer on the road, from having to attach and detach cars, and perform shunting operations at stations, and are therefore more costly as regards both fuel and wages. Wear and tear of rails and rolling stock, and running expenses, and other items, must, of course, be charged in their proper proportions against through trains. But buildings, bridges, fences, works, signals and ballasting must be provided and maintained, and decayed sleepers must be renewed, and the line must be kept clear of snow, and other expenses of management and so on must be incurred, irrespective of the through traffic. For purposes of investigation, however, the through traffic has been divided into eight different descriptions, and forty-five different items of expenditure have been examined and classified, and by considering them in detail we are able to arrive, as accurately as the case will permit, at the figures which it is necessary for us to ascertain. We discover what we can and what we cannot convey at a profit, what it is to our interest to convey and what to refuse, and what would be the total loss to us of the discontinuance of any portions of our through traffic. There is no doubt that in the past mistakes have been made, and I had something to say on that subject when I was last in Canada. We can, of course, afford to carry at lower rates westward, in cars which would otherwise run empty, than eastward in cars which must be specially sent forward to return, perhaps, empty. But traffic had at times been carried at rates which were too low, especially in connection with the steamship arrangements which then existed, but were afterward altered. We have since had frequent conferences on these subjects, and our officers clearly understood our wishes in these respects, and have, as I have already mentioned, declined this year large quantities of traffic which might have been obtained at rates lower than the figures which they have agreed upon with us as those which do not yield a sufficient margin of profit. And you may rest assured that we are now neither refusing what is profitable nor carrying what is not profitable to the company. When it is alleged that the arrangements of the company are a subject of dissatisfaction in Canada, I am happy to be able to give a general and unqualified denial to that statement. At no previous time has the business of the company been more efficiently conducted, nor have our efforts even been more generally appreciated. During the past twelve months eleven additional sidings have been put in, under agreements with traders, besides twelve others for traffic purposes; and thirty-nine leases have been concluded for land on different parts of the line for the erection of buildings to accommodate traffic. No good opportunity is neglected for developing the local traffic by these and other means. We may hope, when this period of dire depression has passed away, to receive the full benefit of these and other improvements. But the people of Canada would certainly not approve of the proposition that we should either discontinue our through traffic, or, having done so, that we should seek to obtain higher rates and greater profit on our local traffic. There are, and there always will be, local traders who complain that we charge higher rates for local than for through traffic, and who would desire to reduce the remuneration we are able to obtain. But, unfortunately, the average of local rates was not, in 1877, above half of what has been stated, and they are not, in any case, such as could fairly be complained of on the one hand, or can satisfy us on the other hand. There is no fear of our being too arbitrary in that matter. We are subject to competition in all directions, and, more or less, at all seasons. When navigation is open, the boats on the St. Lawrence carry grain, flour, dry goods, hardware, etc., at rates varying from 0.35 to 0.40 of a cent—say one-fifth of a penny—per ton per mile; and when it is closed other railway routes compete with us at different parts of our system. And further, the farmers and the millers will sometimes hold back their traffic for weeks before the opening of navigation to get a slight reduction of rate. The competition for through traffic, which we could not stop if we were to withdraw from it altogether, seriously affects also the local rates over our own and other systems.

The rates for freight were so low during the latter part of the half-year that we declined, as I have already stated, to carry large quantities of traffic, and preferred to let it go by other routes. But even so we carried an increased quantity. We moved in the half-year 359,892,589 tons one mile in 1878, against 341,328,890 in 1877, and we received in money \$598,148 against \$585,831 for their conveyance, being an increase of £12,315, and showing an average rate of 0.77 of a cent against 0.86 of a cent per ton per mile in 1877. The average rate of the corresponding half-year, miserable as it was, would thus have given us on the same tonnage \$79,600 more net profit. The freight-car mileage amounted to nearly seventy-one millions of miles against sixty-six millions for a train mileage of four and a quarter millions against four millions of miles; the average load per car was 6.06 tons, against 5.69 tons; and the dead weight of cars to each ton of freight 1.65 tons against 1.76 tons. This proportion of dead weight to paying load comes out better, apparently, than at any previous period; and is, considering the nature of the traffic and the preponderance of east-bound freight, a good result. It is especially important in times of low rates to economise in this and other ways, to the utmost extent, the cost of conveyance.

During the half-year the Michigan Central Railroad has practically been amalgamated with the New York Central interest. Mr. W. H. Vanderbilt, having purchased a controlling power, elected his own board of directors, and himself as President of the Michigan Central Company. It became necessary for us, therefore, carefully to consider our own position, and to prepare for any contingencies that might arise. Earnestly desiring peace, we were compelled further to investigate the various routes still open to us, if it should become necessary to counteract hostile action. The Michigan Central Railway has hitherto been our chief means of communication with Chicago and the West, and our interchange of traffic with it has always been very large, and mutually advantageous. We have much to give them, if they have more to give us, the eastward being heavier than the westward-bound traffic. While we desire to receive a fair share of the traffic they have to bestow—and we may properly expect to carry—they have always been jealous of our forwarding from and exchanging traffic with other routes. But it has never yet been possible to form any permanent or satisfactory arrangement with them on which we could rely, giving us, so to speak, an in-

dependent and secure position in Chicago. Our main object, during the prolonged negotiations two years ago with the Great Western Company, was not merely to avoid all future risk of competition with the Great Western, but still more to effect joint arrangements, which would then have been possible, with the Michigan Central Company. The position has now changed. It is no longer the Great Western or the Michigan Central Company with whom we have to deal, but Mr. W. H. Vanderbilt. He has purchased, by very large expenditure, a position of great influence, but also of serious risk and responsibility, while our attitude is in all respects the same. We wish for nothing more heartily than to make fair and durable arrangements with him for interchange of traffic with the Michigan Central, and for the avoidance of competition with other sections of his vast system. Conciliation, forbearance and courtesy have been displayed between our officers on the one side, and Mr. Vanderbilt and his officers on the other side. Some progress has been made, but there is a vast field to be covered, and we wait almost daily the result of further negotiations, which it is desirable in his interest as well as our own to conclude before the close of navigation.

The final objects of all such arrangements are, of course, fair divisions of traffic, and the maintenance of reasonable rates, in order that we may jointly obtain adequate remuneration for the work we perform; but that object, simple as it may appear, requires more time and labor than any one could conceive who is not acquainted with the details to be mastered, the questions that have arisen through long years of negotiation, and the difficulties to be overcome. There are many different classes of traffic to be dealt with; and many large and powerful systems of railways, besides the system of Mr. Vanderbilt, to be represented in the discussion. When I was last in New York, about thirty western lines were represented, besides the five trunk lines. There are also thirty or more centres to be considered from which traffic must be divided. It is of little use to arrange pools, for instance, in regard to traffic from Chicago, St. Louis and Cincinnati, so long as rates are cut, as they have recently been, from Peoria and Indianapolis, to the disturbance of rates from all other centres. Durable benefit can only be obtained when sufficient control is established by the adhesion and with the concurrence, at all events, of the principal systems. There is, perhaps, no subject on which we have been more attacked by our rivals, or misunderstood by our friends, than that of our connections with New England. It would only recall past irritation, and lead to no good result, to recapitulate the long story of the correspondence, and of our propositions, so often rejected in past years, with a view to settlement of this question. It is sufficient here to state, what you will be glad to learn, that a real and satisfactory approach to a settlement of this and other vexed questions, concerning which so much has been said and written in past years, was arrived at on July 1, 1878, in reference to "the division of freight west from Boston and New England competitive points." An appeal to arbitration was made, and, after a deliberate and careful consideration of the whole case, a decision was rendered by the arbitrator, on July 1, under which we received practically as much as we had contended for. It was then settled that the northern route, i. e., the Central Vermont and Grand Trunk companies, were entitled to 21.3 per cent. of each class of domestic freight, and 30 per cent. of each class of foreign freight. And Mr. Pink, in rendering his award, made use of expressions which I must take the liberty of reading to you. He wrote: "In conclusion, I may be allowed to say that I duly feel the responsibility of making a decision in this complicated question, the more so as I find myself placed in a rather delicate position from the fact of having been selected as arbitrator for one of the parties—the Central Vermont and Grand Trunk Railroads—while I was in the service of the other party, viz., the four trunk roads. I desire to avoid, if possible, even the appearance of being influenced in favor of the latter party; and when I entertained a doubt as to the correctness of any of the above decisions, I am free to say I have given the benefit of the doubt to the Central Vermont line. But, believing in this case, the facts and principle upon which the decision is based are so clearly defined as to admit of little doubt, I trust I may not have given cause for a charge of partiality by either party; and I have never heard a complaint of partiality brought against him by either party."

This, gentlemen, is, I submit, a sufficient justification of our former contentions; and you will, I am confident, approve of our attitude when I say that we are in like manner ready to refer our claims of all sorts, and in regard to all other traffic, to the decision of any fair and impartial arbitrator. Our representative at the August meetings at Saratoga, Mr. Seargeant, has been deputed by Mr. Hickson to attend at a number of such conferences, and has gained the esteem of our most powerful rivals, who have themselves admitted and stated that he has acted in a liberal and conciliatory spirit, while they, at the same time, expressed a different opinion of the action of another company. We watch the proceedings of the conferences most closely, and I think it only right to place thus before you the reason for our confidence in our officers, and to show you that you may rely upon the mode in which these most important affairs are, under our instructions, being conducted by them. You need have no apprehension, under the able management of Mr. Hickson, and with the valuable assistance of Mr. Seargeant, either on the one hand, that our interests will be in any way sacrificed, or that, on the other hand, any opportunity will be suffered to pass of promoting good feeling and harmony, of settling all differences in a forbearing spirit, and on a liberal basis, of submitting differences to fair arbitration, and of concurring in any proper precautions with a view to the enforcing and carrying out in practice of such agreements as may be concluded. Such, at all events, are our own views, and such is our policy. A smaller volume of traffic at reasonable rates is better than a larger volume at rates ruinous for ourselves and every other competing system; and we are prepared to accept less in divisions of traffic than we may consider ourselves fairly entitled to if by so doing we could ensure durable arrangements for our own good and for that of all other companies interested in the conveyance of the vast traffic which has formed during the past four years the subject of so much unwise, unmitigated, and unprofitable contention and competition. It would only be wasting much of your time and wearying you unnecessarily if I were to go into details in regard to all the agreements already arrived at, but I may sum them up by saying that they refer to (1) west-bound traffic from New York and the Eastern to the Western States; (2) west-bound traffic from Boston and New England points; (3) east-bound New England live-stock traffic; (4) east-bound dressed-meat business; (5) through passenger business between Detroit and Buffalo; (6) live-stock traffic from Chicago and Michigan via Buffalo; (7) the Erie & North Shore Line. As you may not understand what the Erie & North Shore Line means, I may explain it is a consolidation of fast-freight lines effected some time since, in which eleven railway systems are interested. The arrangement fell through early in the present year, but has now been again agreed to, as well as the Chicago and Michigan live-stock traffic, subject to the concurrence of the Great Western Company. The arrangements which we desire next to effect are those for interchange of traffic with the Michigan Central Company and for a division of the

bulk of east-bound traffic. This last is the most important outstanding question.

Our policy is perfectly consistent, perfectly simple and perfectly straightforward. We desire and intend to obtain from every description of traffic all the net profit that it is capable of fairly affording. We will not carry traffic at a loss, but we will not renounce traffic which yields a profit. (Hear, hear.) Our interests are identical with those of the Dominion of Canada, in so far as their prosperity will be to our advantage, and our prosperity will improve their credit. Our true interests are also identical with those of the other great railway systems of the American Continent. (Hear, hear.) We wish for nothing more earnestly than to agree with them, and that they should agree with one another, in fair divisions of traffic. We all have enough to do in contending with water carriage for seven months in the year without trying to ruin each other for the remaining five months. (Hear, hear.) We have all been suffering for four years because we chose to fight with one another, and tried to circumvent one another, in place of coming to reasonable terms, and keeping the agreements that we pretended to make with one another. There is through traffic enough, even in times of depression, to make us all comfortable. We, none of us, gain anything ultimately by undue competition. We all carry, in the end, the same proportions, but at lower rates. Peace and harmony, with fair arrangements and reasonable rates—prayer Heaven we may come to them at last—would make the local as well as the through traffic on every railway system more profitable, and are certain elements, whenever they can be realized, of immediate prosperity.

Defense of the Management of the Great Western, of Canada.

Though there is much that is indirectly interesting in the following speech of President Childers in response to complaints made by shareholders at the last half-yearly meeting, it is published chiefly as an example of the ordeal through which English railroad presidents are liable to pass and are likely to pass if anything goes wrong:

The Chairman—If no other gentleman wishes to address the meeting, I will do my best to reply to the observations which have been made; and perhaps you will allow me to say at the beginning that I made no comparisons with other companies. I most carefully guarded myself against doing so. I made no reflection on those who went before us. I said what we had done, I explained our objects. I explained the policy we had adopted from the beginning: how we had gradually worked up to that policy, and had been seconded by our officers; that it was a policy of restricting the capital expenditure to the last degree, and of keeping on working terms of friendship with our neighbors; not going into great schemes of extension, but taking the matter as we found it, to put your property in the best condition we could. I will now answer the remarks which have been made, not so much *seriatim*, but as a whole, for different gentlemen have made much the same remarks. It has been suggested that the present board, since they took office, have gone into schemes which Mr. Adams* says he opposed; that they have brought about a great increase of capital, and that the result is that a state of things which was highly satisfactory before—according to Mr. Smith†, when he was connected with the company, getting good dividends, having good profits, going into no schemes whatever—has come to be a company with no dividends, and going into all sorts of schemes. I say most distinctly there is no foundation for that suggestion. When I came into office I found the Company bankrupt. I state that most distinctly. I found it committed to every kind of expenditure; and actually I had not been a week in the chair when I called my colleagues together and said: "What have we to face? Look at those schemes, some of which must be carried out, some of which we will attempt to escape. Look at your ways and means, and how are we to carry out the policy which every wise man, wishing to protect his property, and the interests which he represents, would desire to see carried out?" Some have talked about the Detroit & Milwaukee and other extensions. Not one of these was ours. They were in existence when we came here. I confess it is a most unfortunate position, requiring great attention; but it was not we who pledged the company to those extensions, and built the air line, and neglected to secure the Canada Southern. It was not we who broke the arrangement with the Michigan Central, or who failed to make an arrangement about the International Bridge. That was all before our time. We found the company in a position of great financial difficulty. I take no credit to myself or to any individual member of the Board, but I say we have worked honestly together, with a thoroughly efficient manager. I attach no blame to any individual who came before us. But this, at any rate we have done, we have brought round the company into a position of financial safety, and have gradually worked up a policy which, when the full effect is seen, will show you—(Cheers, in which the conclusion of the sentence was inaudible). That is my answer to Mr. Smith. It is all very well for him to come here and talk of the great things he did when he was a director—this is not the first time that he has done so. He is a very intelligent and respectable man, but you knew him, and did not think fit to take his policy and displace ours. He attacked us from the first. He wanted us to carry out an amalgamation with the Grand Trunk, which you, by an overwhelming majority, disposed of. We have carried out the policy approved of by the shareholders, and now, when we are in the very act of bringing that policy to a conclusion—if you pass a resolution displacing it, for, I do not suppose for a moment any one of my colleagues will accept it—if you think that is the way to proceed, "swapping your horses," (as Abraham Lincoln said) "in the middle of the stream," you are worse business men than I expected to meet here in the City of London, and than I know you are. Excuse a little warmth. Personally, I am at your disposal; but I am speaking for those who have worked very hard, and been in a difficult position in Canada. With regard to Mr. Yates' remarks about the officers, all of whom, he says, he knows, he came here and attacked Mr. Broughton, and speaking personally—

Mr. Yates—I never spoke to him in my life.

The Chairman—I said you came here and attacked him at the time you were engaged in a heavy lawsuit with the company, which lawsuit Mr. Broughton was doing his best to defeat, and the shareholders can, therefore, draw their own conclusions on the subject. One word about my colleagues. I dislike to speak about myself, but when such an attack has been made—

Mr. G. Smith—Not personal.

The Chairman—I understood it is not personal, it is parliamentary. Mr. Smith has been pleased to make a parliamentary attack on me, and has asked what my salary is. When the board was reformed, you added £500 to a year to the remuneration of the board, and you made an economy to the same amount elsewhere, and I was asked to come here

* One of the auditors.

† For ten years a director, retiring in 1874.

and be the Chairman. I had not had the least previous connection with those who asked me to come. I came at their request and tried to do my duty; if you think you are tired of me and would like to try somebody else as Chairman, pray do so. But as long as I am here, I shall endeavor to do my duty, and I appeal to you to give me that support with which no Chairman can carry it out effectively for the interests of those he represents. Then Mr. Smith says he wishes the Board to be London men. But are you all London men? A great amount of stock is held in Liverpool, Manchester and Glasgow; is it not convenient that some of the board should represent country stockholders? We have three from London and four in the provinces, and we find it feasible to hold periodical meetings, and to transact current business at meetings held between and attended by those who are available. A colleague reminds me that a very large amount of traffic done by this company with the Continent, is really transacted from the very cities from which gentlemen who sit as my colleagues come who are not in London. Then Mr. Smith was very indignant because we asked for proxies. I believed he also asked for proxies when he was a director, and when he was not re-elected a director he also asked for proxies on his own behalf. Mr. Hale seconded the motion, but I have not taken a note of anything worth answering in his remarks. Mr. Bridgewater says: "Why cannot we give a dividend on the preference stock?" It would be rather inconvenient at this moment to explain that. If we had done so, we should have been in a very awkward position in respect to the reserve funds. We are perfectly right in postponing it. I think, for if we had passed a dividend it would have broken down entirely the basis of those reserve funds. These funds, as I have said, will occupy our consideration, and we may be able to put it before you in a more satisfactory way at the next meeting. Mr. Yates said that Mr. Broughton had a bad Canadian reputation; but I say distinctly he is an honest, straight-forward man, and perhaps may express himself strongly when the occasion requires strong expressions, and it may be disagreeable to some persons to hear truths from him; but he is a faithful servant of the company and of the traveling public, and all I can say is if you are led away by suggestions such as that, and you displace Mr. Broughton, it will grievously injure your property. Then Mr. Yates says we have not expended enough on locomotive account. "Hit high! Hit low!" it is the old story. Somehow or other, we must go wrong. If we spend much on locomotive account, Mr. Smith says we are extravagant. If we spend little, Mr. Yates says we are not. I do not know; but I take the figures in page 52 of the report, and I find that in 1873 we spent £74,000, exclusive of fuel, on locomotive repairs and renewals, and £57,000 on fuel. In 1875 it is brought down to £63,000 on repairs and renewals, and £47,000 on fuel. In 1877 it is brought down to £48,000 for repairs and renewals, and £34,000 for fuel; and it stands at about that now. The reduction is about the same in each. We have spent less consistently all through. Mr. Chester made some sensible remarks, and asked me if I could say distinctly as to the locomotive stock expenditure. I am not going to make comparisons with the Grand Trunk; let them take care of themselves. When I was in Canada, not long ago, I went carefully into the matter, and I know that the locomotive stock is held in thorough efficiency, and the Superintendent certifies to its efficiency. A large amount of that stock is not in use, but in reserve; and if you allow for the contingencies of our climate, those figures will compare favorably with those of other railroads. One of Mr. Yates' objections is amusing. He says we have built a new Hamilton station—that was decided upon a long time ago, before I was Chairman. But he says there is going to be built a new London station. I could not conceive what the meaning of this was, but I find it is at East London, a populous village, that a new station has been built at a cost of £244, and that is the foundation of his tirade against us for building new stations. Mr. Lockerby asked why we spent more in fuel. Because we have run a good deal more train mileage. He will see that the train mileage is largely increased, and that being so, we cannot avoid burning a greater amount of fuel. He then asked me why we had increased our law expenses. It so happens that the whole of the additional legal expenditure was incurred in Canada, and I do not think that is a subject on which you would wish for details. It is a matter which we have looked into and we fully understand, and you may rest perfectly satisfied that the small increase was necessary, although we do not publish the details. He then asked about the directors' holdings, and intimated that he would move that the amount of those holdings should be printed in the report. I do not advise you, gentlemen, to require anything of the sort, because that would be laying down the principle that the more stock an individual holds the better director he would make. I do not believe that. What you ought to do is to settle what is the least amount of stock which a man should hold in order to qualify him. Now, what has been done in this matter? At first the director's qualification was 10 shares only; it was then raised to 40 shares, and it now stands at 100. You have said by resolution that 100 shares shall be the minimum holding of a director, and I should regret to see a rule laid down which would imply that the larger the holding the better would be the director. I say that while the largest holder might make a very good director, it does not at all necessarily follow that the two things could go together. What I would ask you to do is, keep the qualification at a sufficiently high figure. I have no doubt that the Canadian Parliament would increase the qualification if you approved and applied to it for that purpose. It is a matter entirely for the shareholders, and they must act as they think fit. With regard to the remarks of Mr. Adams, who has a perfect right to speak as he has done—yet I must say it is rather awkward and disagreeable to have to combat in a large meeting a colleague, as I may say—one whose duty it is to examine the accounts, and one to whose honest performance of that duty we all attach value. But I must ask, in reference to what remark, what was the use of Mr. Adams referring to what happened when the late Mr. Fildes and we were acting together on the subject which he mentioned? We have had nothing to do with what was done at that period in reference to the Detroit & Milwaukee Company. We found arrangements of old standing which had brought you into great difficulties; we did our best to bring you through them, and we succeeded. Mr. Adams told you that £1,900,000 of capital was gone. He said that £1,900,000 was all gone, but of course he did not mean that all the money had been lost by us. I have told you that we have spent but little additional capital. We have incurred no additional outlay, except in carrying out what we found has been undertaken when we took office, with the exception of the expenditure of the Welland bridge, which could not be avoided, and the improvement of the Brantford Railway. As to our having spent £1,900,000, the thing is out of the question, and we have done our best to resist any increase of capital expenditure. Well, gentlemen, I think I have now answered all the questions, and as I do not suppose you wish me to speak at great length, I will now put the question.

The Great Western of Canada.

At the half-yearly meeting, held in London, Oct. 30, the President (Right Hon. Hugh E. C. Childers) made the usual speech, from which we take the portions referring to the pooling arrangements made, and in contemplation and to the Detroit & Milwaukee purchase:

Now let me say a few words on the salient events of the last half year and on the prospects of the company in connection with those important events. These salient events are two—one is the agreement for "pooling" our traffic with the Canada Southern Railway for six months, then subject to a three months' notice; and the other is the acquisition which we may now hope is all but finally completed of the Detroit & Milwaukee Railroad on satisfactory terms. Since I had the honor of becoming your chairman, the board and myself have had in view two great lines of policy. We have explained them to you, but not at too great length, as we wished to postpone more detail until we had reached the time when those two great principles might be considered to be satisfactorily in force. One of these principles is to endeavor to arrive at satisfactory arrangements for dividing our traffic with our neighbors—that is a totally different matter, and that has never been the wish either of the board or of the shareholders. But we wished to divide our traffic on satisfactory terms with our neighbors so as to enable us to get rid of a vast amount of unnecessary competition in train mileage, and of competitive rates and competitive agency charges, and to put our company in the position of railway companies in England, where reckless competition fortunately is now the exception, instead of, as it has been in America too many years, the rule. In pursuance of that determination we have told you we should set our faces against wild competition, and do all we can to act harmoniously and make fair and equitable arrangements with our neighbors. The Canada Southern Railway was the great difficulty of our company. When I came here I little knew into what troubles we had launched when we found that (through whose agency, or from what causes I do not say now) actually there was built up alongside of our main line a competing line, and that we had gone and built another competing line against it, and spent money which does not return us at this moment one farthing of interest. As I have told you our policy has been to do our utmost not to launch into additional expenditure, but by degrees to arrive at harmonious arrangement with this rival, as well as with other companies, the end of which we hoped might be some present concession to arrive at a prospective and satisfactory advantage as to the division of traffic. That we have succeeded in doing, and we have every reason to believe, and I repeat with great pleasure the words spoken by Sir Henry Tyler two days ago, that the Grand Trunk Company will now follow in the same suit, that instead of trying to bring about amalgamation, the difficulties of which were very great, we should arrive at good pooling arrangements, get each the traffic we can best carry; and I have no doubt that not only the Grand Trunk, but also other companies will come into similar arrangements with each other and with us. I am asked to tell you what the word "pooling" means. It means the putting together all the receipts from traffic and dividing them between the competing companies in certain proportions, so that they should no longer be competitive with each other, but should each receive the share belonging to it. It is called by some English railway companies the one-purse system, by some the Gladstone award, and by others the principle of the Scotch traffic agreement. You agree to carry the traffic on the best terms, and to divide the proceeds, and that is what we think should continue to be carried out.

Another of our great objects was to secure a good position in the Western States of America, so that we should no longer be a mere link in a through line, but have a satisfactory terminus in that part of the United States from which a very large amount of traffic is derived and to which a considerable amount is directed. We have worked very carefully, consistently and steadily to that end, and we believe that we have now in the reorganized line going to Milwaukee, and from thence to the other side of the lake, reached the great northwest system, and through our arrangements with American lines we expect to be in a much better position. We have had of course, in order to accomplish this, to make adequate financial arrangements for that purpose. This has been a matter of discussion for many years at our meetings, and proposals were made to you some five years ago under which a very large sum would have had to be advanced by this company for the control of a route which might not have been successful. We have succeeded (I will not state the figures as I have given them three times and you have approved of them) in finally carrying out the arrangement with regard to the Detroit & Milwaukee road of which you approved, and when that arrangement is completed our position I feel satisfied will be on a better footing. I may add that with all respect to all our neighbors, that our relations are satisfactory. We are on excellent terms with the great railway interest headed by Mr. W. H. Vanderbilt, whose objects are the same as ours, and also with the reorganized Erie connection, with whom we hope to continue to exchange profitable traffic.

There is another point in this connection which deserves remark to you, that is our general policy at the present time. I think our policy has been a wise one. I am not dissatisfied that it has taken some time to work out to its present point. We are thoroughly satisfied with the efficient management of our General Manager, Mr. Broughton, and with our careful Solicitor in Canada, and with all the heads of our departments. We have now had considerable experience of their working, and I say distinctly that it is thoroughly satisfactory to the board as well as to myself.

The Railroads and the Post-Office Department.

From an abstract of the report of Hon. David M. Key, Postmaster-General, we copy the following:

After describing the rates of compensation prescribed by law for railway mail service, the Postmaster-General says: "The appropriation made by Congress at its last session was not sufficient to pay for the existing service of the railroads thus prescribed. In addition to this fact the weight of the mails carried is constantly increasing, and new railroads, and parts of railroads, are being continually added to our postal routes. It became an embarrassing question to the Department whether the railway mail service should be reduced so as to correspond with the appropriation, or whether it should be continued as it then was until Congress should meet, and the question might be referred to it for its judgment and discussion. It was believed by the Department that it would not do to withdraw the service from such a number of railroads as would reduce the cost of transportation within the amount appropriated. The only other method of reducing the expenses of this service would have been to discontinue the service as carried on and conducted by our postal-car system entirely, or to such an extent as would bring the expenditure within the appropriation. To have adopted this course would have led to great confusion and delay, and to great dissatisfaction and complaint on the

part of the public. It would have carried us back to the system in vogue before postal cars were used. Separation offices would have been required on the lines of railways, at which the mail would have been stopped and deposited for separation and distribution, instead of having this separation and distribution made without detention or delay on the moving trains, as is now done. Another difficulty in the way of continuing such a course is, that it would necessarily lead to a large increase of force in such of the post offices as might be made offices for separation of the mails, and no appropriation by Congress had been made or considered, so far as I am aware, for such a purpose. Hence, I have delayed making such radical change in the service as would be required by reason of the sum appropriated to this branch of the postal service until Congress could be consulted upon the subject. Should no additional appropriation be made for this service, I shall feel it my duty under the law so to curtail the service as to fall within the appropriation, however much I might consider the public interests injured thereby. I am satisfied it would lead justly to much complaint. Mails would be detained at offices, in separation, hardly ever less than twelve hours, and generally twenty-four hours. Books, papers, and packages, passing over great distances, or circuitous routes, would be detained at more than one such office in very many cases, and there would be delay in the immense number of transactions which are initiated, conducted and completed by communications through the mails. For this cause business men would send their messages by telegraph instead of the mails, to a great extent, and the delay in the transmission of the remittances of business men would add largely to the sums they pay by way of interest and exchange. In my opinion it would cause a shock to our postal system from which it would not soon recover. Railway companies, which have been at the expense of furnishing postal cars, might be slow to furnish such conveniences a second time, and there is no law to compel them to do so."

He again invites attention to the service rendered by railway companies in carrying the mails between stations and post offices, and says it should either be made an element of the basis of compensation, to be paid for according to the work done on each route, or the railway companies should be relieved from this duty, an unpaid service being always a source of dissatisfaction. Attention is again called to the insufficiency of the compensation allowed under law for service on many short routes. During the last session of Congress bills were presented to amend the law regulating the compensation to railroad companies for carrying the mails so as to base the rates of pay upon the items of "space, speed and frequency." It is suggested that the space to be paid for on each route should be limited to a specified amount or certain weight of mails. Otherwise the compensation of all railroads, and consequently the expenditure of more than \$9,000,000 annually, would be left to the discretion of the Postmaster-General, and he thinks it is clear this should not be done.

The Present Condition of the Iron Trade.

The condition of the iron trade, at the present time, is a peculiar one. In some branches complaint is made of a dullness which is equal to any that has been experienced since the panic, while in others the most intense activity prevails. In pig iron the condition of the market varies with locality. In the East prices have declined to an unprecedentedly low figure, and over-production appears to be bringing about its natural result, the financial embarrassment of the weakest companies. With the prices at which iron is now being sold in New York and Philadelphia, it is difficult to see how any of the furnaces in the Lehigh and Schuylkill valleys can be making any profit. If any are doing so, it is only those which have exceptional facilities, such as the ownership of the best mines and of the most improved and best equipped blast furnaces. The law of the "survival of the fittest" is now being applied in the East with the utmost rigor. In the vicinity of Pittsburgh there is a somewhat better state of affairs, and prices have been well maintained. While the majority of furnaces in the Shenango and Mahoning valleys are out of blast, there are eight furnaces in blast in Pittsburgh and only four out, those in blast being the largest in the country, and those out of blast of only moderate size. The production of the furnaces in the vicinity—although the number of furnaces in blast is not so large as it was a few years ago—is probably larger than it has ever been, so great has been the increase in their capacity. That there is no over-production is indicated by the fact that three new furnaces are about to be built by the Edgar Thomson Steel Works, and one by the Cambria Iron Company, which company is also about to put in blast one of its old furnaces which has been out for some years.

Fears are expressed that when these five furnaces are put in blast that such an over-production will take place that the price of pig iron in this market will fall below a paying figure. This, however, will depend upon the consumptive demand at the time, the amount of which is a mere matter of conjecture. Should the over-production take place we have no fear that it will put any of the new furnaces out of blast. They will be well located, and will have every advantage in procuring their raw material, in cheapness of manufacturing, and in disposing of their product. It will be the smaller and older furnaces which will suffer, as the furnaces of the Mahoning and Shenango valleys have suffered by the immense production of our recent Pittsburgh furnaces.

One feature of the present state of the iron trade is noticeable, namely, the tendency to concentrate the trade in the hands of large corporations, and especially the Bessemer steel companies. In this we are following the example of Europe, where the magnitude of the works of Krupp at Essen and Schneider at Creusot have long been the wonder of modern metallurgy. The Bethlehem, Harrisburg and Cambria works have had blast-furnaces ever since their steel works were started. They are now making efforts not only to obtain within their own control the iron and even the ores from which the steel is made, but to utilize their product in other shapes than rails and billets. The capacity of each of these works is continually increasing; and Harrisburg is reported to be putting in three new converters, in addition to the two already in use. Harrisburg also makes Siemens steel in the open hearth, and Cambria is preparing to follow its example.

Another prominent feature of the trade is the rapid development of the Siemens open-hearth process within the past year. Two open-hearth furnaces have gone into operation in Chattanooga and a third is contemplated, two are building at Cambria, two at Springfield, Ill., one at Portsmouth, Ohio, and four in this city, viz., one at the works of Anderson & Passavant, one at Hussey, Howe & Co.'s, and two at Schoenberger & Co.'s. This development of the open-hearth process is not at the expense of either the Bessemer or the crucible works, for these also are enlarging their capacity. The crucible steel works in this city are both enlarging their capacity and increasing the variety of grades. Park, Brother & Co. have recently completed the alterations in their works, giving them a capacity of 252 pots, or 50 tons per day, and Miller, Metcalf & Parkin are turning their attention to making the very finest grades of steel, for which we have heretofore been dependent upon Europe.

On the whole, the iron trade is in a transition state. The dying out of old furnaces, the building of new ones, the alternate stagnation and activity of the wrought-iron business, the constant and increasing activity of every branch of the steel trade, the substitution of iron for wood, and of steel for iron, the multitude of new types of iron and steel furnaces, direct processes, etc., all struggling for existence, at once furnish a problem for the iron-master the like of which has not been seen in this generation.—*American Manufacturer.*

The Tanner Brake Decision.

Thomas Sayles commenced a suit in 1861 against the Chicago & Northwestern Railway Company for an infringement of the Tanner brake patent, which was a patent upon connecting the two trucks of an eight-wheeled railroad car by means of a horizontal centre lever so that all the brakes could be operated from either end of the car. This Tanner device is somewhat used in the South, but is scarcely used at all in the East or West. In the East the Hodge brake and in the West the Stevens brake, which are other devices for accomplishing a similar purpose, are almost exclusively used. In the case above referred to, the defendant used the Stevens brake. In that case there were three questions: First, is the Tanner brake patent valid? second, does the Stevens brake infringe that patent? and, third, what should be the measure of recovery by the owner of that patent for such infringement? The suit has been very stubbornly defended for the Northwestern Railway Company by the Western Railroad Association for the last seventeen years, and it was finally decided on Monday last in favor of the railroad company by the United States Supreme Court. From the advice yet received, it cannot be stated how far the Supreme Court went into the question of the validity of the Tanner patent, but it decided positively that the Stevens brake was not an infringement of the Tanner patent, and reversed the decision of the court below and directed the dismissal of the complaint.

The decree entered in this case by the Circuit Court (Judge Drummond) was for 70 miles of the 2,000 miles operated by the Northwestern Company, and was for 5 years of the 21 years of the life of the patent, and the decree amounted to about \$47,000. On this basis the liability of the Northwestern Company would have been about \$1,200,000; and the liability of all these in the country between thirty and forty millions. This case does not finally dispose of the patent, for it does not decide the question whether the Hodge brake infringes the Tanner patent; the present case being dismissed and the Northwestern road as well as a large number of other lines being discharged from any and all liability upon the finding of the court that the Stevens brake does not infringe the Tanner patent.

It is unfortunate that the Supreme Court did not in this case reach the question of damages, for all large users of patented devices have been for a considerable time complaining bitterly that the rules of recovery which have obtained in patent legislation are extremely absurd and unjust. The above figures of thirty to forty million dollars, as well as the finding in the swage-block case of the Circuit Court for the infringement of the Cawood anvil for mending rails, have furnished frequent illustrations in the arguments in support of the bill for the amendment of the patent law now pending in Congress.

It is the opinion of those having these matters in charge for the railroad companies that the Hodge brake will also finally be held not to infringe the Tanner patent, and that those companies which have used the exact device of the Tanner patent, so far as they have not already settled, must pay a reasonable license fee of about \$5 per mile of road operated at the date of infringement.

The defense of this case has been under the management of George Payson, Esq., the able General Counsel of the Western Railroad Association, which in this case as in so many others, has proved a most valuable servant of the railroad companies which belong to it.

Universal Co-operative Express Company Proposed for Great Britain.

In Great Britain the railroad companies themselves conduct what we would call the "express business" of their several lines, and some in this country have thought that in this they were worthy of imitation. But in the following communication to the *Railway Sheet*, the writer proposes that, to get the advantage of a single organization working over an indefinite number of connecting lines, the railroads join together to form a company, something like one of our co-operative freight lines, which would take charge of the collection, carriage and delivery of "parcels" all over the kingdom:

It is gratifying to learn that negotiations are now going on among the associated railway companies for carrying out a universal system of prepaying the carriage of small parcels by the agency of adhesive stamps, and there is little doubt that ere long, in some form or other, the scheme will have a trial. The only serious obstacle in the way is the manner in which the receipts are to be apportioned among the companies, and it is hard to solve the problem, but it has been suggested, that so long as each company's interest in the common fund is separate and distinct, an insuperable difficulty will present itself. A way out of the dilemma has been hinted at, which, if taken up vigorously and influentially, might overcome all objections. As it is simple, it commends itself to one's notice.

It is that a company shall be incorporated to purchase the exclusive right of carrying the whole of the parcels traffic of the United Kingdom by railway, and the *modus operandi* would briefly be as follows:

The new Parcels Carrying Company to guarantee to every railway company in the Kingdom an income for a term of years based on past experience, with a certain percentage of increase to cover the growth of the business. The companies to act as agents for the sale of the stamps, and to perform all services in connection with the collection, forwarding, and delivering of the parcels as at present. Way-billing and book-keeping to cease except in the case of parcels above a certain declared value, which would be entered up similarly to registered letters that pass through the Post Office, and signatures taken therefor in like manner. There should be some stipulation with regard to the profits of the new company, that, in the event of more than a certain dividend being paid, a bonus should be allowed therefrom to the railway companies; and if the business assumed gigantic proportions, which doubtless it would, then the new company should appoint its own servants to travel with the trains, like the Post-Office sorters and others now do, in the mail tenders. Clerks might also be engaged by the parcels company to receive parcels and sell stamps in large towns, in order to facilitate the transmission, as well as afford additional convenience to the public. It would be to the railway companies' advantage to encourage the separate employment of officers and servants for such duties, because it would relieve

their own staff, and, if judiciously managed, could, in the course of time, develop itself, and ultimately lead to the entire traffic, except the railway transit, being under the control of the parcels company, like the mail system is now vested in the Postmaster-General. There was a time when the acquisition by Government of the railways was so seriously talked of that a Royal Commission was appointed to report upon such a project as regards the Irish railways; and since the Government have taken over the telegraphs with a result far exceeding the most sanguine expectations, it might not be too bold a thing to hint at the Government undertaking the carrying on of the small parcels business throughout the land into their hands.

The saving in clerkage, by reason of account-keeping being abolished and division of receipts being done away with, would be very great, and in a variety of other ways economies would ensue which were never dreamt of. This is a bold scheme and one that would be attended with some difficulties in maturing, but if the companies could constitute themselves into a joint-stock enterprise for the purpose, the profits which could be by the system above stated be enjoyed by the separate company, would go into the pockets of the railway companies. The idea seems deserving of consideration, and we have pleasure in putting the subject before our readers in its present shape for them to judge of its practicality.

RAILROAD LAW.

The Tanner Brake Patents.

Washington dispatches report the following decision of the United States Supreme Court in the case of Sayles against the Chicago & Northwestern Company, appeal from the Circuit Court for the Northern District of Illinois:

This was an action brought by Sayles, the present appellee, for an alleged infringement of letters patent granted in 1852 to one Henry Tanner, upon an improved car brake originally invented by Thompson and Bachelder in 1847. The Court holds that the Stevens brake used by the railway company is not an infringement of the Tanner patent, now owned by the present appellee, because when Thompson and Bachelder, Tanner's assignees, filed their original application in 1847, at least two other kinds of double brakes, similar in construction to theirs, were already in use; that the construction and mode of operation of the Stevens brake are altogether so different from those of the brake owned by the present appellee that they must be regarded as independent inventions. The decree of the Circuit Court is therefore reversed, with costs, and the cause remanded, with directions to enter a decree dismissing the bill of complaint. The opinion was delivered by Justice Bradley.

Liability of Company for Wrongful Transfer of Stock.

The United States Supreme Court has just decided a point of some importance in the case of Davenport against the Western Union Telegraph Company, appeal from the Southern District of Ohio. The question involved was whether or not a joint stock company is liable to an individual stockholder for a certificate of stock which has been stolen from him, and which the company, upon a forged power of attorney, has transferred upon its books to another person. The Court holds that there can be no question as to the right of such a stockholder to have his stolen shares replaced, and a proper certificate issued to him therefor, and to receive all the dividends which shall have accrued thereon since the unauthorized transfer. Forgery, it is held, cannot confer any power or transfer any right, and the company is clearly required to exercise proper care to prevent the use of a forged order or certificate.

Individual Liability of Directors.

In the case of Shea against Mabry and others, Mr. Shea was a contractor on the Knoxville & Ohio Railroad. When he had performed the work, the officers of the company had no money to pay him. The amount sued for was \$20,000 or thereabouts. He filed a bill in the Chancery Court to hold the president and directors of the road individually liable, alleging that they had used a large amount of money, more than sufficient to pay his debt, in lobbying with the Legislature for the purpose of securing the passage of a bill granting additional state aid. He gained his suit, and judgment was rendered against the President, Gen. J. A. Mabry, and all the directors who voted for the expenditure complained of, for the amount of Mr. Shea's debt and costs. The case was carried up to the Tennessee Supreme Court, which now affirms the decision. The important part of the Supreme Court decision is as follows, the first four heads relating only to technical points, as to the manner of bringing suit, forms of depositions, etc.

5. The particular charge in the bill relied upon to hold defendants liable is, that they had used \$28,300 of the money of a railroad company, either in an attempt to procure other and further appropriations from the state, or had permitted the president of the company to use the same for his own individual purposes—the complainant being a judgment creditor of the road and seeking to reach the funds so misapplied—Held, under the facts and circumstances of the case, that the complainant could recover against the president and directors of the road.

6. Good faith will not protect even the trustees in bad acts, nor is ignorance any excuse for not knowing what they should take the pains to learn. Directors are not mere figure-heads of a corporation. They are trustees for the company, for the stockholders, for the creditors and for the state, and are required to exercise constant vigilance and the utmost good faith, or they must answer for it to their *cestui que trustent*.

A Coroner's Verdict against Railroad Directors.

Herapath's Journal says: "At Ballincollig (County Cork), the Coroner having resumed his inquiry relative to the late accident on the Cork & Macroom Railway, and having summed up, the jury returned the following verdict: 'That the deceased, Michael Brew, James Rattray and Thomas Murphy, were killed on Sept. 8, at Curragheen, by the engine of the Macroom train getting off the rails and portion of the train being upset owing to the defective state of the sleepers. We are of opinion that the directors—William H. Hussey (Chairman), Sir John Arnott, Captain Rye, Charles Raycroft, Timothy Mahony, E. R. Mahony, William Harrington, and Denny Lane, with the Superintendent (Frederick Lyster), and the walking ganger (John Flynn)—were culpably responsible. We attach no blame to the deceased engine-driver, Rattray.' The Coroner intimated that on that verdict he would issue his warrant for the arrest of the parties named. On the application of counsel the court was adjourned until Friday, for the purpose of being prepared with bail. The only reasonable solution of this verdict appears to be that the inquiry was an Irish one, and that the finding of the jury was in accordance therewith." But it is not impossible that the verdict, though Irish, was good. Directors who absolutely refuse to permit necessary repairs to be made, when informed of their necessity, ought to be held criminally responsible for the results.



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EDITORIAL ANNOUNCEMENTS.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particularly as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

THE GROWTH OF GRAND TRUNK FREIGHT TRAFFIC.

Although we have followed pretty closely the published accounts of this company's affairs, including its half-yearly reports and the speeches of the successive chairmen at the London meetings of the shareholders, we have nowhere seen attention called to the immense growth of freight traffic on it of late years. The officers of the road have devoted their energies, apparently, when they have written and spoken, to explaining to the stockholders why they have got such meagre returns from their property—which they have done sufficiently to convince any reasonable creature, though apparently not always satisfactorily to the stockholders, who are apt to be impatient of disaster, however inevitable. But it seems strange that more has not been said of the success of the company in attracting traffic. Large expenditures were incurred by the company for this purpose. The gauge was changed, the track renewed with steel, the equipment enlarged and improved. It is true that all this has not much added to the profits of the shareholders, but at least the company can show that if it has not increased profits it has increased traffic enormously, so that if there were now the same margin of profit as when the improvements were planned, they would have been most remunerative investments.

It is only recently that we have seen the statements of traffic which enable us to say just how much it has grown. Only a few weeks ago, in an article entitled "The Growth of Traffic," published Oct. 25, when we compared the traffic of the trunk lines for the past five years, we could give the Grand Trunk's tonnage mileage only for the last half of each year. Since that time the figures have been published for the whole of each year, and also, with the last report, for the first half of this year.

We confess to astonishment at the results recorded. The Grand Trunk is shown to have had a vastly greater

growth of freight traffic than any other of the trunk lines that report. The Erie and the Pennsylvania each carried about 8 per cent. more in 1877 than in 1873, and the New York Central 27 per cent. more; but in the same time the increase on the Grand Trunk was 76 per cent. On the four roads taken together the freight traffic grew from 4,137 to 5,006 millions of ton-miles, and of this increase of 869 millions, no less than 335 millions, or 38 per cent., was on the Grand Trunk, which has had but an insignificant increase of mileage. Its increase in quantity has been four times as great as the Erie's, three times as great as the Pennsylvania's, and about the same as the New York Central's. In 1873 it had less than half as great a traffic as the Erie; in 1877 it had seven-tenths as much. The Baltimore & Ohio does not report tonnage mileage, but we know that its through freight traffic has increased very largely. But while a great deal of attention has been paid to the growth of traffic on the Baltimore & Ohio, little has been said of the Grand Trunk. The latter has a larger mileage than any other of the roads named, and consequently a much lighter average traffic per mile of road; but as its increase must have been chiefly in through traffic, it has apparently had great success in diverting through traffic from the other trunk lines since its gauge was changed. The report for the first half of this year indicates that the business of this year will be still larger than that of 1877. For the half-year the increase over 1877 is more than 14 per cent.

The figures representing this traffic are given below. To make the reading and comparison of them easier they are made to represent millions of ton-miles. Thus the 389.9 given for the first half of 1878 means 389,900,000 ton-miles.

Grand Trunk Freight Traffic for Five and a Half Years in Millions of Ton-Miles.

Year.	First half.	Second half.	Whole year.
1873.....	202.7	238.8	441.5
1874.....	263.0	322.1	585.0
1875.....	278.1	342.7	620.8
1876.....	332.8	377.2	710.0
1877.....	341.4	435.4	776.8
1878.....	389.9		

If we take the years ending with June, so as to come down as late as possible, we have for that ending with June, 1874, which was a year of heavy crops and a theretofore unprecedented freight movement, 502.7 millions of ton miles as the business of the road; while for the year ending with last year, also a year of heavy crops and freight movement, the traffic is 825.3 millions, which is more than half of the New York Central's and about three-quarters of the Erie's traffic for the year last reported—a less favorable year, however.

Comparing now the trunk-line traffic for the four roads reporting for the five years, which is a repetition of the table given Oct. 25, with the Grand Trunk for the whole or each year instead of the last half only, we have, again in millions of ton miles:

Trunk-Line Traffic for Five Years.	1873.	1874.	1875.	1876.	1877.
Grand Trunk.....	441.5	585.0	620.8	710.0	776.8
New York Central.....	1,277.5	1,391.6	1,404.0	1,674.5	1,619.9
Erie.....	1,033.0	1,047.4	1,016.6	1,040.4	1,114.6
Pennsylvania.....	1,384.8	1,372.7	1,479.4	1,629.7	1,494.8
Total.....	4,136.8	4,407.7	4,520.8	4,074.6	5,006.1
Baltimore & Ohio.....	1,072.9	1,257.7	1,309.2	1,808.7	1,714.3

* Thousands of tons (not ton-miles) of certain leading traffic staples, chiefly but not wholly through freight.

The Baltimore & Ohio figures, we must specially warn the reader against confounding in any way with the others. They indicate wholly different things, and are adduced only as giving some clue to the increase of traffic. They are, however, chiefly for the items of traffic which have increased greatly, and do not include, for instance, coal, which has decreased 950,000 tons. If all the freight noted above was through on the Baltimore & Ohio—that is, carried 380 miles from Parkersburg or Wheeling to Baltimore—and all the coal was carried from the junction of the coal railroad 206 miles to Baltimore, then the tonnage mileage of these traffic staples has increased in the aggregate about 8 per cent. in the five years, the loss in coal going far to balance the gain in other freight. This is by no means conclusive, but the great reduction of earnings since 1873 and the stationary train mileage indicate that the growth in the aggregate traffic of the old lines has been moderate, however great the increase of through traffic has been, and very great we know it to have been.

From this we conclude that by far the most rapid growth of traffic has been on the Grand Trunk, which seems to have gained as much as or more than the Baltimore & Ohio in through traffic, while we have no great loss like that in the Baltimore & Ohio's coal traffic to set against this gain.

But great as has been the increase of traffic on the Grand Trunk, it never would be inferred from the freight earnings—still less, doubtless, from the net earnings from freight if we had them. Its largest

freight receipts were in the year ending with June, 1874. Those for the year ending with last June, in spite of a traffic greater by three-quarters, were 5½ per cent. less. In this it has not been singular, however. Baltimore & Ohio freight earnings ("main stem and branches") in the same time decreased 28 per cent., and New York Central freight earnings from 1874 to 1877 (1878 not yet reported) decreased nearly 19 per cent., the Erie's 30 per cent. and the Pennsylvania's 14½ per cent. In these times, that road, so to speak, has gained most which has lost least, and the Grand Trunk, we see, comes much nearer than the others to earning as much as it used to. And its aggregate net profits have increased somewhat, while those of other trunk lines have decreased, though this is doubtless chiefly due to its change from a very bad condition to an exceedingly good one—almost a reconstruction of the road.

In these days a great increase of traffic is very likely to be followed by a great reduction or the total destruction of its value. A new competitor is not permitted to enter the field or greatly increase his share of the traffic for which others compete without having to fight for it; and doubtless among the causes which have had most to do with the slaughtering of through rates of late years have been the successful efforts of the Grand Trunk and the Baltimore & Ohio to get a larger share of it—a success which may not have been worth what it has cost, because it is at least possible that the old amount of traffic at the rates which would have been received but for these efforts to increase the traffic would have produced greater net earnings than the larger traffic at the actual rates. And the new competitors usually get less rather than more than the average rates for through traffic, which is indicated by the greater reduction of average freight rates on the Grand Trunk than on most other roads. From 1873 to 1877 its average rate fell from 1.46 cents to 0.83 cent, gold, or 44 per cent.; the New York Central, from 1.65 to 1.01 cents, currency, or, say, from 1.44 to 0.95 cent, gold, or 34 per cent., and the Pennsylvania's from 1.41, currency, to 0.98 cent, or from 1.21, gold, to 0.93 cent, gold, or 23 per cent. That is, the new competitor, if successful in diverting traffic from those who formerly controlled it, not only causes a general reduction in the rates to all the carriers, but a special one on its share: it carries for less than the other roads actually get, though they get much less than they used to.

This might not always be the case. The new competitor, if as good as or better than the old lines, would soon be able to get as much as they, probably, though even then it might have to make concessions to establish a traffic. We know that from very important traffic centres a very large portion of the traffic—in some cases the largest portion—continues to go by a circuitous route, apparently for no other reason than that that route was the first one established, and for a few years had the field to itself.

But the other effect, a general depreciation of the value of the traffic when new routes divert important portions of it, seems pretty sure to follow, and deserves to be borne in mind by all who are proposing to open new routes to places already sufficiently supplied. While it may be quite practicable to get an important share of the traffic, the getting of any profit out of it is much more questionable. The Union Pacific gets ten millions of earnings and six millions of profit from the transcontinental traffic. We will open a new line and get half the traffic, and therefore five millions of receipts and three millions of profits, which will satisfy our modest ambition very well—especially as our road will cost but a quarter as much as the Union Pacific. This is common reasoning, and reasoning that is often acted upon. But more probably the result will show that our new road, even if it gets half the traffic (which it will scarcely ever do) receives but three instead of five millions of earnings, and but a million or half a million of profits—perhaps even no profits at all. In 1873 it seemed that if the Grand Trunk could obtain a freight traffic of 775 millions of ton-miles, it would make \$2,300,000 on it. But in 1877, when it had got that traffic, it made but about \$1,300,000 on it. And that is the way such things are apt to turn out.

The success of the Grand Trunk in increasing its traffic after it changed its gauge leads to the inference that if the Erie, an acknowledged, well-established trunk line, had changed its gauge and made the other improvements then proposed, in 1873, it too might have increased its freight traffic in a somewhat similar ratio—not so fast, surely, because an increase in the same proportion would have given it a larger business than the New York Central's, and there would have been no more traffic to divide in that case, only a different division of it. Was that an opportunity missed or only an opportunity postponed? An opportunity missed, we fear. The change of gauge

and other improvements are still justified, doubtless; would be simply as reducing expenses, it is probable; but they will not have the effect now that they would have had five or six years ago in promoting traffic. The field then, west and east, was comparatively clear. Now it is to a much greater extent parceled out and occupied. The other trunk lines command most of the Western roads from which traffic might have been secured, and they are less likely than then to suffer any important diversion of their traffic. But the great growth of traffic on the Grand Trunk may be considered a justification of the statements made in 1872 of the necessities of the Erie. The latter would not have been considered an interloper in the market for through traffic, and probably would not have excited so fierce an effort to prevent the diversion of traffic as was caused by the Grand Trunk and the Baltimore & Ohio. As, however, its increased competition would have in no respect diminished that of the other two roads, rates would probably have fallen at least as much as they have, if the Erie had been put into perfect condition.

The Grand Trunk, having now secured a very respectable share of the through traffic, seems inclined to become conservative. Having got the business, it now desires to make it profitable, which, owing to the length of its line for much of its through traffic, it cannot always do at the rates of recent years. It is one of the most earnest advocates of an apportionment, as it well may be, as such an arrangement would be likely to multiply several times the profits on east-bound traffic it was able to get between January and August this year, or on the traffic in both directions during pretty much the whole of the year ending with June, 1877. It has shown its power pretty effectively and unmistakably, and doubtless it receives, and will receive, more consideration from the other trunk lines than they would have 'deigned to give it a very few years ago. It has shown that it can get a very respectable amount of through freight, and that it can spoil the value of perhaps ten times as much more; and these are valid claims for consideration. It will not probably ever make a great deal of profit on its through traffic to and from New England, but it may easily make a great deal more than it ever has hitherto. Should the deepening of the Welland Canal make Montreal a great grain port, it may have a heavy through traffic to that port which it will be perfectly placed to conduct, as well as the Pennsylvania to carry to Philadelphia or the Boston & Albany and the New York Central to carry to Boston, and for which it will have no important rail competitor. Its managers do not seem to count much on this, however, and they very properly give their energies to the development of the existing business, in which, as has been shown above, they have had remarkable success.

The Baltimore & Ohio Report.

The Baltimore & Ohio report is made in such form as to render it impossible to get from it much of the information which we find most interesting on other trunk-line reports. It gives no other statement of the amount of traffic carried than the number of tons of certain staples of through and other traffic on the main stem, which is good as far as it goes, but gives no adequate idea of the aggregate freight traffic of the road. Then the President's report, which alone has appeared at this time, does not even give the receipts from freight, passengers, etc., separately—only the total earnings, but with the expenses of the "Main Stem and Branches" in detail.

Still the report deserves and will command attention, especially as it is the first of the trunk lines to report for the year—the year ending with September of this year, and a year of exceptionally heavy traffic in the leading staples of east-bound freight, grain and provisions, during the first three months of which east-bound rates were comparatively high and well maintained, during the next seven or seven and a half months generally miserably low, and for the other month and a half tolerable, while during the whole year west-bound rates were almost perfectly maintained; a year, too, of generally light passenger traffic.

This company works 1,500 miles of road, including 560 miles west of the Ohio River; but earnings and expenses are also stated separately for the "Main Stem and Branches," including 623 miles of road, which is more properly comparable with other trunk lines, though of less extent.

But taking the whole system together, a considerable improvement is shown over the results of the preceding year—an increase of \$556,420 in earnings (4¼ per cent.), and a decrease of \$456,754 in expenses (5½ per cent.). This gives an increase in net earnings of \$1,013,174, which is more than 20 per cent., and makes them the largest in the history of the company,

though but 8 per cent. greater than in 1874, when there was 413 miles less road. The changes will appear from the following comparison of gross earnings, working expenses and net earnings for the past six years, during which, by the way, there has been a large increase in the mileage worked; the 263 miles of the Chicago Division having been added in 1875, and the 150 of the Pittsburgh Division in 1876:

	Gross earnings.	Working expenses.	Net earnings.
1872-73.....	\$15,093,198	\$10,141,823	\$5,551,576
1873-74.....	14,947,090	9,416,651	5,530,440
1874-75.....	14,444,239	9,908,065	4,535,573
1875-76.....	15,031,236	9,009,857	5,421,380
1876-77.....	13,208,860	8,226,055	4,982,805
1877-78.....	13,765,280	7,709,301	5,995,979

It was to be expected that earnings would be increased in the last year, which was one of exceptionally heavy traffic, but hardly that there should be any considerable decrease of expenses. Details of expenses are given only for the "Main Stem and Branches," and there, where about three-fifths of the expenses were incurred, the decrease was inconsiderable, but in all repairs except of freight cars there was a decrease of 18 per cent., nearly balanced by a great increase in expenditures for repairs and construction of freight cars.

This company is known to have greatly increased its through freight traffic of late years, and it would probably have materially increased its earnings in spite of the decline of rates but for the loss of an important part of its traffic. The effect of the road on the traffic of other trunk lines and the business of the several Atlantic exporting cities makes it especially important to study its traffic. The change in the traffic of the road since 1873 has been very great. The reports give us tonnage of leading items of through traffic only and not tonnage mileage of the total. Of the items given, the tonnages for 1872-73 and 1877-78 are as follows:

	1877-78.	1872-73.	Inc. or Dec.	P. c.
Through freight.....	1,149,490	640,265	I. 509,224	79.6
Flour.....	77,821	94,063	D. 16,242	17.2
Live stock.....	132,462	87,000	I. 44,862	51.6
Lumber.....	41,270	50,675	D. 9,405	18.7
Grain.....	520,361	200,284	I. 355,077	177.4
Coal.....	1,119,387	2,918,718	D. 900,331	44.6
Total.....	3,070,800	3,092,965	D. 21,865	0.7

This is an example of how the consideration of aggregates of traffic by themselves may mislead. The figures of the totals above show very little change indeed from 1873 to 1878—not more than might be expected to occur from year to year in the business of any well-established railroad, and the trifling change shown is a decrease, whereas we know that one of the great phenomena of transportation of recent years has been a growth of traffic over the Baltimore & Ohio Railroad. But the consideration of the items which go to make up this total explains it all. There have been enormous increases and one enormous decrease. Through freight, live stock and grain have increased enormously, but their increase has been more than balanced by the enormous decrease in the coal traffic. If the figures were for tonnage mileage, there would be an increase, doubtless, and not a decrease; for the grain is nearly all through freight, carried as much as 380 miles, while the coal is carried little more than 200 miles at most. But generally, the business for which the other trunk lines compete has increased very greatly since 1873—grain, as we have seen, more than 175 per cent., while the increase of what is reported by the title of "through freight" is probably chiefly in hog products and other provisions, and to some, but not a very large, extent in merchandise going west.

Another matter of special interest is the working of the Chicago Division, which hitherto has not shown very satisfactory results, either in the quantity of traffic obtained or the profits from carrying it. The traffic is not given in the report, but it is indicated by the Chicago Board of Trade reports. The earnings, expenses and profits since the opening of the line are given below:

Chicago Division, Baltimore & Ohio Railroad.

Year.	Gross earnings.	Working expenses.	Net earnings.	Deficit.
1875.....	\$959,164	\$1,169,332		\$210,168
1876.....	1,231,786	1,065,083	\$166,703	
1877.....	957,696	834,415	123,280	
1878.....	1,057,559	628,011	429,548	

This division is 263 miles long, so that the gross earnings for the last year have been at the rate of about \$4,000 a mile. The astonishing thing is that there should have been so great a reduction in the cost of working it. The local traffic on this line is very light, and it must have been quite a feat to work this road for about 60 per cent. of last year's through rates. The previous year the working expenses of this division were 87 per cent., in 1876 87 per cent., and in 1875 122 per cent. Now they drop to 60 per cent. The net earnings reported are at the rate of \$1,600 per mile, which is probably 5 or 6 per cent. on the cost of the road, which was quite small.

Further examination and discussion of this report we must postpone for the present.

Debates at English Shareholders' Meetings.

We have often referred to the democratic policy of the British railroad companies in their shareholders' meetings. The half-yearly reports of the companies are published at least a week before the meetings, and at the latter the President, or Chairman, as he is usually called there, makes a speech, in which he makes comments on the working of the company during the half-year and its position—usually very much such matter as that with which our presidents often preface their reports. But the peculiar feature of these meetings is the freedom with which any shareholder makes inquiries and criticisms—a freedom that may sometimes degenerate into license, as it is apparently sometimes resorted to by speculators who only desire to effect (usually by bear attacks) the market price of the company's securities; but on the whole it is an opportunity for letting the partners in the enterprise learn what they want to know about their business which is pretty well utilized and is altogether desirable.

The companies whose management is most criticised naturally are those which make poor returns, or have reduced or ceased to pay dividends. The Grand Trunk of Canada and of late years the Great Western meetings have been the occasions of a great deal of complaint and inquiry, in very many cases indicating very great ignorance of the railroads' business, but none the less giving occasion for explanations which doubtless were heard gladly by many besides the inquirers; while the liability and probability of such discussions with individual shareholders doubtless makes presidents and directors more cautious than they otherwise might be, and careful to fortify themselves with good reasons for any policies that may be questioned.

As an example of the gauntlet which an English President has to run, we publish elsewhere the remarks made at the last half-yearly meeting of the Great Western of Canada by President Childers, in reply to sundry animadversions made by various members present, but chiefly by Mr. George Smith, who was formerly a director and Vice-President of the company, but was retired after the disasters of the company had begun, to make room for the present management. Mr. Smith compared the administration of the present board, which pays no dividends, with that when he was director, when as high as 6¼ per cent. was paid one year; he questioned the value of the Detroit & Milwaukee purchase; said the Canada Southern ought to have been prevented (which his own board tried desperately to do and failed); thought some fusion with the Grand Trunk ought to have been effected and a combination of the two with the Erie to make face against the Vanderbilt roads; and complained that the Great Western did not become half-owner of the International Bridge at Buffalo when it had a chance. "I do say deliberately," Mr. Smith said, "that our Chairman's introduction into this company has been a mistake from the beginning, and that it has landed us in disaster." He closed by moving for a committee of investigation. A Mr. Lockerby condemned expenditure to "stick up large placards in large hotels which were never looked at;" a Mr. Williams supported Mr. Smith's motion for an investigation, and said he thought the board or their agents and managers in Canada were being made "the tools of Vanderbilt." Another of the critics was a Mr. Adams, one of the auditors of the company, who thought the expenditure on locomotives insufficient to maintain them, and thought the just-purchased Detroit & Milwaukee road would never pay; which reminds us that at the Grand Trunk meeting the day before a shareholder had found fault because the expenditures for locomotive repairs was so much greater than on the Great Western. This Mr. Adams, by the way, was a candidate for reelection at this same meeting; and though the meeting sustained the board at its report by an overwhelming majority, Mr. Adams was reelected Auditor by a unanimous vote. Honest criticism, it seems, did not make the criticised management his enemy; for it certainly could have commanded some votes; and this is as it should be. Indeed, we are inclined to think that in every corporation where there is a division among the shareholders, the minority should be allowed to select one auditor.

The remarks of Mr. Childers will indicate the kind of questions which are put at such meetings, better even than the questions themselves as we find them reported, and to these remarks we commend the attention of readers who wish to know the working of an English shareholders' meeting.

Foreign Railroad Notes.

Speaking of the prizes given at the Paris Exhibition, the *Moniteur des Intérêts Matériels* says: "The favorites of fortune—beg pardon: of the jury—as well as those who have not had the luck to please, feel that

The reports of the discussions at the last convention are comparatively brief. Committee reports and similar papers which cover 150 pages are followed by reports which cover less than 40 pages of this book. This, however, is a great gain over the previous convention, when many of the papers were not discussed at all, and 25 pages included the reports of the debates on the committee reports.

The last report is illustrated by a good many engravings, though not so many as in the previous one, when the report on locomotive and tender-trucks gave illustrations of more than twenty different standard patterns.

In nearly every report of this association of late years there has been some paper or papers of permanent value; and the new one is no exception.

EDITORIAL LETTERS.

IV.

CHICAGO.

The changes which have occurred in any place are more apparent to a former resident who revisits it than to any one else. He naturally compares the things of to-day with those of former years, and the impressions produced by the changes are therefore sharper and more vivid than they are to those who have been witnesses of their gradual progress. In Chicago the visitor is at once reminded of the enormous growth of its railroad system. What is most apparent is the great increase of the traffic of the roads. Their extensions and the connecting lines, which reach across the fertile prairies, wind in among the valleys and cañons of the Rocky Mountains and stretch across the continent, are, of course, not seen in Chicago, and require some act of faith to be realized, but the traffic and its attending prosperity are seen on all sides.

But there has been another kind of growth, which is the result of the consolidation of various roads into great systems. Fifteen or twenty years ago the lines centering in Chicago consisted of little more than a hundred or a few hundreds of miles each, and their annual receipts were counted, perhaps, by hundreds of thousands. Now, there are about a half-dozen separate organizations, whose lines terminate in Chicago, each one of which operates over a thousand miles of road and has a yearly income which is counted by millions of dollars. Although this subject has been the topic of a good many commercial conventions, and after-dinner speeches, and has been discussed by the papers so that the whole world has heard about it, yet it seems as though the railroad companies themselves hardly realized the fact, or at least have not adjusted the management of their roads to the altered condition of things. Any one who will look over a list of the corps of officers will see that there has been little if any change in the system of organization from that which existed fifteen or twenty years ago. At that time Western roads were each managed by a general superintendent, who had charge of the different departments, and exercised authority in deciding matters of detail in all of them. The extension of the line or construction of new branches was done under his direction; the kind of rail, rail-joint, switch and signal to be used was determined by him; his opinion controlled the weight, proportions and plan of locomotives and cars; the designs for bridges were submitted for his approval; the rules and regulations for running trains were devised by him; he fixed the rates of freight and fare of passengers; and, in short, he had the authority and its consequent responsibility of the multifarious details of all of the different departments. This condition of things and this form of organization and theory of management still exists, although the magnitude of the affairs to be managed has increased nearly or quite tenfold, and in extent and complexity is now quite beyond the capacity of one man to control. The managers of the principal lines here have, it is true, been obliged to employ assistants; and, on nearly all of them, there is now either a general manager and a general superintendent, or a general superintendent with an assistant to help him; but the system of government is still, to a great extent, that of a one-man power. That the duties and responsibilities of such a position are now very much greater than one man should or can bear is indicated by the frequent breaking down in health of those who have borne such responsibilities for any considerable time. It would be easy to name a half-dozen such men and to prophesy with certainty of as many more that they will reach the same end in a few years. Intercourse with the superintendents of Chicago rail roads reveals to a visitor not infrequently that weary, dejected look which indicates with such painful certainty that the mental strains to which the official is subjected exceed very much the limit of physical and mental elasticity. The prominent examples which have recently been made public, of men who have been obliged to succumb under the responsibilities and duties of such positions have led younger men, who are growing old prematurely, to give the subject more attention than they had thought necessary to give it heretofore.

The evil seems to be due to the fact that the organization of railroad government has not developed in proportion to the increase of traffic and the growth of the roads. A system which enabled one man to manage all the details of a line one or two hundred miles long may be quite inadequate for one of ten times the length, with a business in proportion. This is making itself apparent, and many American railroad officers are beginning to realize the uses of what has derisively been spoken of as "red tape," and to understand that the only way to lessen their labor is to delegate to others the authority to decide, and the responsibility for, the management of whole classes of subjects, which, at present, come under the supervision of the general manager or

superintendent. It is a mistake, though, to suppose that responsibility can be transferred to another without at the same time giving the person who must assume it authority to decide and act for himself. It is folly to tell a man that he will be held responsible for certain things, but he must not do what seems best to him but follow the orders he receives from his superiors. Just to the extent to which he is subject to orders will he feel that he is relieved of responsibility. The reform which seems to be needed is that the management of the different departments should be delegated to different persons, and that the position of the head of a department should be made one of greater authority, honor, responsibility and higher pay, so that the ablest man would feel that to hold such a place for life would be a career worth striving for. At present the only position which young men who are well educated and who have first-rate ability and enterprise enough to manage their own affairs successfully—and if they have not they are unfit to have the charge of those of a railroad company—feel is worth striving for is that of the general manager or superintendent. They now snap their fingers at the salaries paid to the heads of departments, and seek their fortunes elsewhere. The result is that very few of the best class of men are now being trained for such positions, and even if a railroad company felt inclined to follow the plan described, it would perhaps be difficult to get men with the special training which is required. A demand for them would, however, produce a supply, and the method pursued by the Pennsylvania Railroad, of placing well-educated young men in subordinate positions where they can gain practical experience, is one which must ultimately be very advantageous to that company, in supplying specially trained persons for the heads of the different departments.

There are evidences, though, that the system of separate departments is gradually working itself out on the Chicago and other roads. On the Illinois Central the machinery department is now managed under one head, but, what is quite singular, there is no road or engineering department. On the Chicago, Burlington & Quincy Railroad the machinery and car departments have been consolidated; the same has recently been done on the Chicago & Alton road. On the latter there is now a Superintendent of Maintenance and on the Chicago & Northwestern there is a Chief Engineer, and the machinery department is under the supervision of the Assistant General Superintendent. Several of the roads now have traffic managers, and the inclination on the part of the general officers to delegate the authority to manage the separate departments is manifest on all these roads.

There must of course be a head to every government, and it is unimportant whether the head of a railroad is called president, general manager or superintendent. If the duties of managing the different departments are referred to separate heads, the organization becomes analogous to that of the President of the United States and his cabinet. In such an organization the heads of departments may be men with special training for the positions they fill, and the duties they must perform, and it may be regarded as a truism that a man is better able to take charge of affairs if he understands them than if he doesn't. The general principle that a person who can manage a department of a railroad as it should be managed must be an expert in that department seems sometimes to be ignored entirely by those who are supreme in authority. It would be as absurd for a captain of a steamship to place the chief engineer under the direction of the surgeon as it is to make the superintendent of machinery of a railroad subordinate to an officer whose only experience has been in the traffic or clerical department. The duties and training of a civil engineer are as unlike those of a mechanical engineer as the work of a brick-layer is to that of a carpenter, and yet it is not unusual to find the former appointed to superintend the work of the latter and *vice versa*. It would seem as if the first question to be asked concerning a man's fitness to fill a responsible position on a railroad is whether he has special training and knowledge of its duties. If not, it should be a conclusive reason for deciding that he is not a proper man for the place.

The attention of Chicago railroad managers, of late, seems to have been directed more into the quiet paths which lead to economy than to the more interesting fields of new enterprises. The Illinois Central is about the only line which is building any new road in Illinois. The Kankakee & Southwestern road has just been completed. It starts from the main line of the former road at a point $4\frac{1}{2}$ miles south of Kankakee, and runs in a southwesterly direction 37 miles to Chatsworth on the Toledo, Peoria & Warsaw line. It passes through a rich farming country, and is built as a feeder to a main line, and will be known as the Sixth or Chatsworth Division of the Illinois Central. The road was built in an incredibly short time. The preliminary survey was made last June, the line was located in July, and the grading was commenced about the middle of August. On Oct. 24 the grading and bridges were all completed, the track laid, the stations and other buildings, fences, telegraph, side-tracks, and stock yards were all completed, and the road in running order. This was done under the immediate supervision of Mr. E. T. Jeffery, the General Superintendent of the Illinois Central, who is the youngest man occupying such a position in Chicago.

The same company is now making the surveys for a branch from Polo, on its Dubuque line, 13 miles north of Dixon, Ill., west to the Mississippi River, a distance of 83 miles.

In the shops of the Illinois Central road there is not much work in progress excepting repairs. Mr. Hayes has been experimenting on an apparatus for collecting scale, and also for washing out boilers, of which we expect to have more to

say at some future time. At the car works some new stock and freight cars are being built, but the principal work is on repairs.

In the shops of the Chicago, Burlington & Quincy Railroad at Aurora, there is a great deal of new work in progress, both in the locomotive and in the car departments. The company is now building as many locomotives as it can with its tools and facilities, and at the same time keep up the needed repairs. A dining car (the Brevoort) has just been rebuilt and is substantially new in design. It is 60 ft. long, and to any one who has never seen such a car, it would seem impossible to concentrate so many conveniences for cooking and eating as may be found in the space which is available in a vehicle of this kind.

A testing department analogous to that at Altoona has also been established at Aurora. Its object is to test thoroughly all the materials bought which are capable of being tested. One of Riehle's large machines for testing bar iron has just been put in. It is 28 ft. long, with a capacity of 200,000 lbs. Two of Ashcroft's oil-testing machines are used for testing lubricants. The laboratory is also provided with chemical apparatus, and shows evident signs of becoming one of the most useful adjuncts to the machinery and other operating and purchasing departments. Mr. Webber is in charge of it, under the supervision of Mr. Higginson, the Purchasing Agent. The latter gentleman has recently made many careful investigations of the quality of rails and axles, by etching their sections, a method which can be used to great advantage. The revelations which are made thereby show, often very clearly, that there is sufficient cause for the one wearing out and for hot journals with the other.

The subject of the cost of oil and brases is attracting a great deal of attention among the different roads, and several of them are now keeping accurate accounts to ascertain the service of brases and cost of oil. It is remarkable, though, what a difference of opinion still prevails. On some roads the faith of those in charge is fixed on hard, solid brases to the exclusion of all others, such as Hopkins' lead-lined bearings, or those filled with Babbitt metal. On some of the roads, Hopkins' bearing is used and much success reported. On several of the lines, such as the Chicago, Burlington & Quincy and Illinois Central roads, crude black oil alone, which costs about 12½ cents per gallon, is used for lubricating cars. On the Rock Island, Pease's coach oil, the price of which is 85 cents per gallon, is used exclusively on passenger cars, and an oil which costs about 25 cents per gallon is used on freight cars. It seems impossible, from the data which are available, to tell which oils or bearings are the cheapest or most effective. On the Rock Island road last year the cost of oil for cars was \$28,000 and for bearings nearly as much more, so that it will be seen that the expense is worth looking after. We are unable now to make an analysis or comparison of the expense of these different items on different roads, but we will probably take it up at some future time. Some system of keeping account of this expense which would supply the requisite data to compare the results on one road with those on another seems to be very desirable.

The American Bridge Company is busy with various orders, the chief of which is the bridge across the Missouri River at Glasgow, of which Gen. Wm. Scoy Smith is the engineer. As our readers have been informed heretofore, this bridge, or the main spans of it, are to be built of steel. This is made on the Hay process, which is the invention or discovery of Mr. A. T. Hay, of Burlington, Iowa.

Portions of the process of manufacturing the steel are still kept secret. As far as could be learned, the process is as follows: The iron is decarbonized either by the Bessemer or any other known process, and is then put into what the inventor calls an electrical furnace, which seems to be simply a small furnace around which wire is wound in reverse direction, and through which currents of electricity are passed. In this furnace the iron is recarbonized by the addition of spiegeleisen and an alloy of various kinds of metal, the composition of which is kept secret. What the object of the electrical apparatus connected with the furnace is, is not explained. The results of the process, however, are such as have led General Smith, who is an engineer of sufficient experience and caution not to venture on any doubtful experiments, to adopt this steel as the material of so important a bridge as the one which he is now engaged in constructing. The steel is made at the Edgar Thomson Steel Works, and is rolled by Messrs. Hussey, Howe & Co., of Pittsburgh. The tests made by the American Bridge Company show that it has an ultimate tensile strength of 86,000 lbs. per square inch of original section, with an elastic limit of 52,000 to 53,000 lbs. These figures are for large bars. In the bridge it will be subjected to strains of from 13,000 to 16,000 lbs.

The bridge will have about 800 feet of iron trestle for the approach on the east side. This will be built by the Detroit Bridge & Iron Works. There will then be two deck spans of 140 ft. each, to be built of iron, three through spans of 314 ft. 8 in., and two deck spans of the same length. The last five are all to be made of steel. On the west side there will be about 2,000 ft. of trestle work, part to be of wood and part of iron, the latter portion of which will be built by the Kellogg Bridge Company, of Buffalo. The whole of the bridge is to be for a single track.

The substructure is to be built by the railroad company. The foundations consist of wooden caissons, sunk by the pneumatic process in the usual way. A new feature, though, is the use of the electric light instead of candles, thus obviating the evil of the smoke from the candles, which has been so great an annoyance heretofore. The rock is from 17 to 50 feet below the surface of low water. The foundations

are now all down excepting one, which will be finished early next year.

It should have been mentioned that the trusses are of the Pratt system, with double intersections. The long ones are 36 ft. deep and 16 feet apart from centre to centre.

In addition to this work, the American Bridge Company now has two spans of 82 ft. each, and one of 134 ft., with single track, and a draw-span over the Chicago River, at Kinzie street, all for the Chicago & Northwestern Railway. It also has five spans of 150 feet each, for the bridge over the Des Moines River, at Eldon, on the Chicago, Rock Island & Pacific Railroad. For the Chicago, Burlington & Quincy Railroad it has one span of 218 feet, four spans of plate girders of 48 feet, and two of 32 feet each.

As an example of an iron car, one built by the National Tube Works, which we had an opportunity to examine, may be of interest. It was a box-car built of a combination of iron tubes and steel rods, held together by clamps on the well-known plan devised by Dr. Lamothe, which he has advocated so indefatigably for many years past. The main frame under the floor of the car consists of four beams, each composed of three two-inch pipes. The posts which form the frame for the sides of the car are made of two 1/4-in. steel rods, which extend entirely over the roof and also form the rafters. The outside rods have tubes on them which form sleeves, or rather distance pieces, to keep the horizontal wooden braces apart. These braces consist of longitudinal pieces of wood to which the outside board covering for the cars is nailed. These boards are covered with paper, and on the outside with sheet iron, which is of No. 27 wire gauge. The body bolsters are made of two tubes at the top and two at the bottom, with wooden blocks driven in between. The truck is of the usual pattern.

The dimensions of the car are: Outside length, 30 ft. 9 in. x 8 ft. 9 in. wide x 7 ft. 7 in. high. It has 1,356 cubic feet of space inside and weighs 17,700 lbs. and its carrying capacity is considered to be about double its weight. The trucks are of the usual pattern. A number of these cars are in use now, and the experience in their use will shed some light on the still vexed question of the use of iron instead of wood in car construction.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

New York & Oswego Midland first-mortgage bondholders, in the Delaware & Hudson Canal Company Building, New York, Dec. 17, at 11 a. m., to act on the proposed compromise with the holders of Receiver's certificates.

Eastern, annual meeting, in Boston, Dec. 11. Transfer books will close Nov. 29.

Macon & Augusta, special meeting, in Augusta, Ga., Nov. 27.

New York, Providence & Boston, annual meeting, at the office in Providence, R. I., Dec. 11, at 10 a. m.

Dividends.

Dividends have been declared as follows:

Boston, Concord & Montreal, 3 per cent., semi-annual, on the preferred stock, payable Nov. 18.

Catawissa (leased to Philadelphia & Reading), 3 1/2 per cent., semi-annual, on the preferred stock, payable Nov. 19.

Ashuelot (leased to Connecticut River), 1 1/2 per cent., semi-annual, payable Jan. 4.

Foreclosure Sales.

The Chicago & Michigan Lake Shore road was sold under foreclosure of mortgage in Grand Rapids, Mich., Nov. 15, and bought for account of the bondholders for \$1,005,000 by Charles Francis Adams, Jr. The sale was made subject to a mortgage for \$500,000 on part of the line and to certain liens on the equipment. The bonded debt, exclusive of the \$500,000 mortgage, was \$5,630,000. The road extends from New Buffalo, Mich., to Pentwater, 170 miles, with branches from Holland to Grand Rapids, 24 1/2 miles, and from Muskegon to Big Rapids, 51 miles. An agreement for the reorganization of the company has been made.

The Cherokee road was sold at Cartersville, Ga., Nov. 5, under a decree of the United States Circuit Court, and bought by Judge J. R. Wilkie, of Bartow County, Ga., for \$29,500. The road is completed from Cartersville, Ga., to Rockmart, 23 miles.

Convention of Railroad Commissioners.

Not much is to be added to the telegraphic report given last week. The gentlemen present were:

Vermont, Commissioner Bailey;
Massachusetts, Commissioners Adams, Briggs and Kinsley;
Connecticut, Commissioners Woodruff, Arnold and Bacon;
Virginia, Commissioner Carter;
Ohio, Commissioner Bell;

Michigan, Commissioner Williams and Mr. Cook;
Illinois, Commissioners Oberly, Smith and Boyne;
Missouri, Commissioners Marmaduke, Smith and Harding;
Iowa, Commissioners Day and Woodruff;

Auditor of Pacific Railroad Accounts, Theophilus H. French.

The committees appointed to report at the next meeting were as follows:

Executive Committee.—A. D. Briggs, of Massachusetts, James Harding, of Missouri, and Wm. Bell, of Ohio.

Relation of Railroad Corporations to the State.—Wm. Smith, of Illinois, Thomas H. Carter, of Virginia, Gen. Marmaduke, of Missouri, M. W. Bailey, of Vermont, and Theophilus H. French.

Taxation of Railroads.—Charles Francis Adams, Jr., of Massachusetts, W. D. Williams, of Michigan, and J. H. Oberly, of Illinois.

Railroad Book-keeping and Accounts.—G. M. Woodruff, of Connecticut; G. M. Boyne, of Illinois; Thomas H. Carter, of Virginia; M. C. Woodruff, of Iowa, and H. A. Turner, of Wisconsin. This committee is also instructed to request the assistance of a committee of expert railroad accountants, Messrs. M. M. Kirkman, of Chicago; C. P. Leland, of Cleveland; G. S. Ford, of St. Louis; W. P. Shinn, of Pittsburgh, and Wilbur, of Boston, being named as such committee.

The adjournment was made until the second Tuesday in June, 1879, the Executive Committee to name the place.

Central Association of General Passenger and Ticket Agents.

An adjourned meeting was held in Chicago, Nov. 14, Mr.

Samuel Stevenson in the chair and Mr. G. H. Daniels, Secretary.

The question of land-buyers' tickets came up for discussion and it was finally resolved to issue no more round-trip colonists' tickets after Jan. 1.

The cutting in rates at Cincinnati and St. Louis was discussed at length, but no action taken.

After appointing a committee to attend the Western Association meeting at Kansas City, the Association adjourned until Dec. 10.

ELECTIONS AND APPOINTMENTS.

Ashuelot.—At a recent meeting of the board, Daniel L. Harris, A. B. Harris and James A. Rumrill, of Springfield, Mass., and Oscar Edwards, of Northampton, Mass., were chosen directors to fill vacancies. The board then elected A. B. Harris, President, in place of S. W. Hale, resigned. The road is leased to the Connecticut River Company.

Atchison, Topeka & Santa Fe.—Mr. George O. Manchester, Assistant General Manager, will have his headquarters at Topeka, Kansas.

Baltimore & Delta.—Mr. Thomas Armstrong has been chosen Treasurer.

Baltimore & Ohio.—At the annual meeting in Baltimore, Nov. 18, the following directors were unanimously re-elected: Galloway Cheston, Francis Burns, John Spear Nicholas, John Gregg, William W. Taylor, Samuel Kirby, John King, Jr., G. A. Von Lingon, Decatur H. Miller, Joshua G. Harvey, William Donnell, Henry C. Smith.

Mr. John Bradshaw, late Assistant Master of Road, has been appointed Master of Road, in place of John L. Wilson, who recently resigned on account of ill health after nearly 30 years' service. Mr. Wilson has been appointed to a new office, Superintendent of terminal tracks and structures in Baltimore.

Mr. H. L. Burgess has been appointed Division Freight Agent for the Pittsburgh Division.

Bedford, Springville, Owensboro & Bloomfield.—Mr. R. Black, of Danville, Ill., has been appointed Receiver.

Boston & Providence.—At the annual meeting in Boston, Nov. 20, the old board was re-elected, as follows: J. W. Balch, T. P. I. Goddard, W. E. Robeson, R. C. Taft, J. H. Walcott, F. M. Weld, Henry A. Whitney. The board re-elected Henry A. Whitney President; B. B. Torrey, Treasurer; A. A. Folsom, Superintendent.

Chicago, Cincinnati & Louisville.—At the annual meeting in Peru, Ind., Nov. 6, the following directors were chosen: Wm. Cutting, David Macy, V. T. Malott, H. H. Walker, Jesse Zern. The road is leased to the Indianapolis, Peru & Chicago.

Chicago, St. Paul & Minneapolis.—The changes noted briefly last week are fully set forth in the following circular, dated Nov. 6: "The offices of General Freight Agent, General Ticket Agent, General Passenger Agent and General Baggage Agent of this company, are hereby abolished."

"Mr. Frank B. Clarke is hereby appointed Traffic Manager of this company, with his office in St. Paul, and will be charged with all the duties of arranging terms and conditions for the transportation of both freight and passengers."

"Reports of sales of tickets by this company over other roads will be made by, and all reports of sales of coupon tickets to passengers passing east over this road should be made to Mr. C. D. W. Young, Auditor, Hudson, Wis."

"Reports of coupon ticket sales to passengers passing west over this road should be made to Mr. W. A. Thrall, General Ticket Agent of Chicago & Northwestern Railway, Chicago, as heretofore."

"All drafts for ticket balances should be drawn on W. H. S. Wright, Cashier, Hudson, Wis., and all drafts drawn by this company on others will be drawn by C. D. W. Young, Auditor, to the order of W. H. S. Wright, Cashier."

An additional circular from Mr. Clarke announces the appointment of Mr. J. H. Hiland as Assistant Traffic Manager.

Des Moines, Adel & Western.—At the annual meeting in Adel, Ia., Nov. 1, the following directors were chosen: T. J. Caldwell, J. O. Risser, L. Lambert, D. A. Blanchard, T. Ashton, J. W. Russell, A. C. Hotchkiss. The board elected T. J. Caldwell, President; S. W. Russell, Vice-President; A. C. Hotchkiss, Secretary; L. Lambert, Treasurer; T. Ashton, Superintendent.

Detroit & Milwaukee.—Mr. W. J. Morgan has been appointed Assistant Superintendent in place of Mr. Callaway. Communications on the subject of passenger fares may now be addressed to Mr. J. F. McClure, Assistant General Ticket Agent.

Fitchburg.—As there have been several changes on this road of late, we give the following list of officers: President, Wm. B. Stearns; Treasurer, Mason D. Benson; General Superintendent, John Adams; Assistant Superintendent, E. K. Turner; General Traffic Manager, E. S. Washburn; Chief Clerk, H. F. Whitcomb; General Freight Agent, C. L. Hartwell; General Ticket Agent, C. C. Daggett.

Mr. Washburn is also General Traffic Manager of the Troy & Boston Railroad.

Great Western of Canada.—At the half-yearly meeting in London, Oct. 30, Mr. James Bald and Mr. Thomas Chilton, whose terms then expired, were unanimously re-elected directors. The retiring auditors, Mr. John Young, Mr. Thomas Adams and Mr. John James Mason were also re-elected unanimously.

Nashville & St. Louis.—The officers of this new company are: President, A. L. Blackburn, Nashville, Tenn.; Secretary, L. S. Goodrich, Nashville, Tenn.; Treasurer, W. K. Murphy, Pinckneyville, Ill.; Chief Engineer, E. F. Falconnet, Nashville, Tenn.

New York, Lake Erie & Western.—The new General Manager, Mr. Robert Harris, brings with him from Chicago as his private secretary Mr. H. E. Wadsworth, who is the son of Mr. E. R. Wadsworth, for several years General Freight Agent of the Chicago, Burlington & Quincy, and latterly General Agent of the Erie in Chicago.

Paint Valley.—Col. Joel Huntoon has been appointed Chief Engineer and Manager of this projected road. He is Chief Engineer of the Scioto Valley road.

St. Joseph & Denver City.—Mr. Joseph Hansen has been appointed General Freight and Ticket Agent. All reports and correspondence connected with either department will be addressed to him at St. Joseph, Mo.

Springfield, Jackson & Pomeroy.—Mr. G. Albert Haggerty, a young mechanical engineer, who learned his business in the Mason Locomotive Works at Taunton, and who for some time was traveling engineer for these works, has been appointed Master Mechanic of the Springfield, Jackson & Pomeroy Railroad. Our readers may remember an account we gave of entire rebuilding of a locomotive by Mr. Haggerty in a cotton-mill at his home in Southbridge, Mass., in 1875. Mr. Haggerty's headquarters are at Springfield, Ohio.

Utica & Black River.—At the annual meeting in Utica, N. Y., Nov. 13, the following directors were chosen: De Witt C. West, John Thorn, Robert Lenox Kennedy, Ludlow Patton, Isaac Maynard, Edmund A. Graham, Wm. J. Bacon, Russell Wheeler, Lewis Lawrence, Abijah J. Williams, Daniel B. Goodwin, Abram G. Brower, Theodore S. Sayre. Inspectors of Election: Chas. P. Leonard, Benjamin F. Ray, Chas. H. Sayre. The board re-elected De Witt C. West, President; John Thorn, Vice-President; Isaac Maynard, Treasurer; W. E. Hopkins, Secretary; John Thorn, E. A. Graham, I. Maynard, A. J. Williams and Russell Wheeler, Executive Committee.

Valley, of Virginia.—At the annual meeting in Staunton, Va., Nov. 13, the following directors were chosen: J. J. Allen, for Botetourt County, Va.; W. A. Anderson, for Rockbridge County, Va.; Gen. J. H. Echols, for the town of Staunton, Va.; Henry Duval, Decatur H. Miller, for the city of Staunton; J. S. Norris, Wm. Keyser, for the Baltimore & Ohio Company. The board elected William Keyser President.

Wabash.—At a meeting of the board in New York, Nov. 19, Messrs. C. K. Garrison, of New York, and Geo. L. Dunlap, of Chicago, were chosen directors, in place of W. Colburn and W. S. Garney, resigned. The board then elected C. K. Garrison President, in place of James A. Roosevelt, resigned. Mr. Roosevelt remains a director. The board now consists of C. K. Garrison, James A. Roosevelt, Cyrus W. Field, H. A. V. Post, Morris K. Jesup, E. H. R. Lyman, all of New York; James Cheney, of Fort Wayne; G. L. Dunlap, of Chicago; A. L. Hopkins, of Toledo; Solon Humphreys and William M. Bliss, of New York; C. Ridgely, of Springfield, Ohio; and A. M. Billings, of Chicago.

PERSONAL.

—Hon. Norman B. Judd, who died at his residence in Chicago, Nov. 11, was born in Rome, N. Y., in 1815, but came to Chicago in 1836. He was best known as a lawyer, politician and Member of Congress, but had been to some extent a railroad man, serving for 12 years, from 1848 to 1860, as Attorney for the Michigan Southern. He had also been at different times a director of the Chicago & Milwaukee, the Chicago & Rock Island, the Mississippi & Missouri and the Pittsburgh, Fort Wayne & Chicago, President of the Peoria & Bureau Valley and the Railroad Bridge Company. He was for several years United States Minister to Prussia.

—Mr. Nelson M. Brown, Superintendent of the Housatonic Railroad, died in Bridgeport, Conn., Nov. 16, aged 50 years. Mr. Brown was for a long time agent at Bridgeport, was made Assistant Superintendent in March, 1877, and in March last became Superintendent after the death of Mr. H. W. Franklin.

—A telegram reports briefly the death of Mr. John Corning, General Superintendent of the Central Pacific at San Gabriel, Cal., Nov. 16. Mr. Corning had been Assistant General Superintendent of the road for many years, but it is only about three weeks ago that his promotion to the general superintendency, to succeed Mr. A. N. Towne, now General Manager, was announced.

Mr. Corning was born in Albany, N. Y., and was a nephew of the late Erastus Corning. For some years he was Superintendent of the Niagara Falls Division of the New York Central, and was afterward in business in Buffalo. He went to California in 1868, and was very soon afterward appointed to a position on the Central Pacific.

—A meeting of the creditors of Charles J. Pusey, the chief promoter of the Sodus Point & Southern Railroad, will be held at No. 143 Powers Building, Rochester, N. Y., Nov. 15. The United States Marshal's list of his debts foots up to \$574,328, in which the Lebanon Manufacturing Company (car-builders), of Lebanon, Pa., stand for \$33,252, the Sodus Point & Southern Railroad Company for \$40,000, John Q. Hoyt, of New York, for \$11,550, the Jackson & Sharp Co., of Wilmington, for \$26,000, Atkins Brothers, of Pottsville, Pa., for \$149,830, the Tredegar Iron Co., of Richmond, for \$22,000, the Bethlehem Iron Co. for \$17,587, the Kellogg Bridge Co., of Buffalo, for \$18,900, W. W. Evans, C. E., of New York, for \$6,139, etc.

—Col. George H. Arms, Civil Engineer of the New London Northern Railroad, died suddenly in Boston, Nov. 6. For some time past he has had charge of the construction of the Manchester & Keene road in New Hampshire, and was on his way home when he was taken sick.

—Messrs. Samuel Nott, late Superintendent, J. H. Butler, Auditor, and E. A. Freeman, Paymaster of the Hartford, Providence & Fishkill road, have been retired by the consolidation of their road with the New York & New England.

—Mr. P. R. L. Pierce, of Grand Rapids, Ind., died in that place Nov. 13. From 1870 to 1877 he was Secretary of the Land Department of the Grand Rapids & Indiana Company and was an active and efficient officer.

—Mr. Thomas B. Lee, of Newark, N. J., has been appointed Assistant Engineer of river and harbor improvements in Brazil, under Col. W. Milnor Roberts.

—Col. W. R. Bowes, Secretary of the Chicago & Northwestern Company, and formerly Land Commissioner of the Fort Huron & Lake Michigan, died in Michigan City, Ind., Nov. 18.

—Most of our readers will remember the sad death nearly two years ago, of Mr. Charles Collins, Chief Engineer of the Lake Shore & Michigan Southern road. It was believed that he committed suicide while suffering from the overwork and mental depression resulting from the Ashtabula disaster. Lately reports have been circulated that he was really murdered, and detectives are said to be now investigating the matter.

TRAFFIC AND EARNINGS.

East-Bound Passenger Rates.

The Cincinnati and St. Louis passenger war has been very lively indeed, and on Nov. 15 the Atlantic & Great Western sold tickets from Cincinnati to New York for \$1, and to Pittsburgh for \$2.75. The other lines did not go below \$5 to New York. On the same day, at St. Louis, tickets for New York were sold for \$10 by some of the lines, while others refused to cut rates at all. Since then rates have gone up a little and negotiations to settle the trouble are reported to have resulted in an agreement to restore rates, granting temporarily to the Atlantic & Great Western the privilege of accepting two dollars less to New York than the rates by the other routes.

Grand Trunk Interchange with the Intercolonial

During the half-year ending with June the Grand Trunk carried over its Rivière du Loup line and delivered to the Intercolonial 46,000 tons of freight in 1878 against 28,000 in 1877, an increase of 64 per cent., and it received from the Intercolonial 20,000 tons in 1878 against 9,000 in 1877, an increase of 122 per cent. President Tyler says that this was "a result, mainly, of European business at Halifax." It

is a much shorter voyage from Halifax to Liverpool than from any United States port, but its rail distance from Chicago via the Grand Trunk is nearly 1,800 miles, and as nearly all transatlantic steamers merely touch at Halifax and have their American terminus further east—at Montreal, Portland, Boston, Philadelphia or Baltimore—they are hardly able to accept lower rates to or from Halifax than from their other American port.

Railroad Earnings.

The following are reports to the Minnesota Railroad Commissioner for the year ending June 30, 1878:

	Earnings.	Expenses.	Net earn.	Earn. per. of mile.	P. c. of exps.
Central, of Minn.	\$55,391	\$24,510	\$30,881	\$1.385	44.24
Minneapolis & St. Louis	359,850	241,938	117,912	4.000	67.21
Red River & Manitoba	141,113	95,401	45,712	4.212	67.06
St. Paul & Duluth	514,823	398,489	116,334	3.046	77.38
St. Paul & Sioux City	620,829	351,474	269,355	5.087	56.00
Sioux City & St. Paul	407,548	183,304	224,164	2.754	44.95
Southern Minn.	853,148	359,643	493,505	5.018	42.16

Massachusetts State reports for the year ending Sept. 30, 1878:

	Earnings.	Expenses.	Net earn.	Earn. per. of mile.	P. c. of exps.
Boston & Lowell	\$1,071,411	\$761,538	\$309,873	\$12.000	71.10
Boston, Barre & Gardner	156,928	116,109	40,219	2.989	74.43
Boston, Clinton, Fitch & N. B.	933,561	683,916	249,645	6.327	71.69
Cheshire	327,588	403,703	123,885	9.770	76.46
New London & Northern	501,442	331,010	170,432	5.014	66.07
N. Y. New Haven & Hartford	3,852,083	2,168,493	1,683,490	25.183	56.28
Norwich & Worcester	700,190	432,632	267,558	10.681	61.05
Providence & Worcester	870,876	591,041	279,835	13.057	67.86
Spring, Athol & N. Y.	100,924	77,863	23,061	2.081	77.10
Worcester & Nashua	473,240	304,888	168,352	5.008	64.46

Other earnings are reported as follows:

Ten months ending Oct. 31:

	1878.	1877.	Inc. or Dec.	P. c.
Cairo & St. Louis	\$183,382	\$199,899	D.	\$16,517 8.3
Cleve., Mt. Vernon & Del.	315,094	390,707	D.	5,013 1.6
Int. & Gt. Northern	1,189,484	1,178,925	D.	9,441 0.8

Nine months ending Sept. 30:

	1878.	1877.	Inc. or Dec.	P. c.
Atchison, Topeka & Santa Fe	\$2,724,819	\$1,754,427	I.	\$970,392 55.3
Net earnings	1,332,694	835,457	I.	497,237 59.5

Eight months ending Aug. 31:

	1878.	1877.	Inc. or Dec.	P. c.
New York, Lake Erie & Western	\$9,735,284	\$9,322,200	I.	\$413,084 4.4

Month of August:

	1878.	1877.	Inc. or Dec.	P. c.
N. Y., Lake Erie & Western	\$1,445,920	\$1,271,131	I.	\$174,788 13.8
Net earnings	569,804	441,538	I.	128,266 28.6

Month of September:

	1878.	1877.	Inc. or Dec.	P. c.
Grand Trunk	\$160,787	\$179,452	D.	\$18,665 10.4
Net earnings	49,443	53,523	D.	4,080 7.6

Month of October:

	1878.	1877.	Inc. or Dec.	P. c.
Cairo & St. Louis	\$21,609	\$24,006	D.	\$2,437 10.3
Cleve., Mt. Vernon & Del.	38,161	37,506	I.	655 1.7
Int. & Gt. Northern	220,607	181,236	I.	39,371 21.7

First week in November:

	1878.	1877.	Inc. or Dec.	P. c.
Chi. & Eastern Ill.	\$20,183	\$17,624	I.	\$2,559 14.5
Denver & Rio Gr'de.	28,087	17,184	I.	11,503 66.9
St. Louis, Iron Mt. & So.	149,400	116,786	I.	32,614 28.0

Week ending Nov. 8:

	1878.	1877.	Inc. or Dec.	P. c.
Gt. Western, of Can.	\$87,784	\$93,599	D.	\$5,815 6.2

Week ending Nov. 9:

	1878.	1877.	Inc. or Dec.	P. c.
Grand Trunk	\$191,957	\$212,352	D.	\$20,395 9.6

Southwestern Railway Association.

Commissioner Midgley, of the Southwestern Railway Association, announces the following rates, taking effect Nov. 14: From Kansas City, Leavenworth, Atchison or St. Joseph, on car-load shipments, in refrigerator cars, destined to seaboard points, on dressed beef or mutton, 37 cents per 100 lbs. to East St. Louis, East Hannibal or Chicago; on dressed hogs, 37 cents per 100 lbs. to East St. Louis, East Hannibal or Burlington, and 42 cents per 100 lbs. to Chicago. In common cars rates will be 5 cents per 100 lbs. less than in refrigerator cars.

It is said that the shipments are now just about equal in amount to Chicago and to St. Louis; in October 60,000 tons went to Chicago and 59,000 to St. Louis.

Cotton Movement.

For the week ending Nov. 15 and for the crop-year from Sept. 1 to that date receipts of cotton at the seaboard have been, in bales, as reported by the Commercial and Financial Chronicle:

	1878.	1877.	1876.	1875.	1874.
Week.....	176,004	194,571	205,006	186,135	152,433
Since Sept. 1.....	1,364,233	1,125,721	1,424,903	1,249,941	1,113,054

The movement last year was very light at the beginning of the season, but after September it was unusually heavy. This year it was heavy to begin with.

The exports for the same periods have been:

	1878.	1877.	1876.	1875.	1874.
Week.....	117,706	94,188	23,578	25.0	
Since Sept. 1.....	626,065	415,627	210,468	50.6	

New Orleans leads in receipts in this last week, for the first time, we believe, this crop year, receiving 22 per cent. of the total against 29 per cent. in the corresponding week of last year. Since August down to Nov. 8 it has received but 10 per cent. of the total against 23 per cent. last year.

Iron Ore Movement.

Shipments of iron ore from the Lake Superior region from the opening of navigation to the end of October were:

	1878.	1877.	Inc. or Dec.	P. c.
From L'Anse.....	30,621	53,861	D.	23,240 42.6
From Marquette.....	457,588	481,290	D.	23,702 4.9
From Escanaba.....	370,719	328,969	I.	41,750 12.7
Total.....	858,928	864,120	D.	5,192 0.5

The season is now drawing to a close.

Coal Movement.

Anthracite coal tonnages reported for the week ending Nov. 9 were: 1878, 462,793; 1877, 514,483; decrease, 51,690 tons, or 10 per cent.

The Anthracite Board of Control has decided to fix the total production for the year at 17,000,000 tons, leaving the companies to fill up their quotas at any time before the close of the year. The official report of the board makes the

total tonnage to the end of October 13,897,196 tons, leaving 3,102,804 tons for November and December. Nothing further has been done as to the extension of the combination after Dec. 31.

The distribution of Cumberland tonnage up to Nov. 9 was as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Baltimore & Ohio R. R.	700,190	681,308	I.	78,882 11.6
Pennsylvania R. R.	129,027	139,188	D.	10,161 7.3
Chesapeake & Ohio Canal	552,239	539,343	I.	12,896 2.4
Total.....	1,441,456	1,359,839	I.	81,617 6.0

Grain Movement.

Receipts of grain of all kinds at the eight leading Northwestern markets for the week ending Nov. 9 have been, in bushels:

	1878.	1877.	1876.	1875.	1874.
4,608,619	4,149,993	3,144,650	3,838,681	2,826,443	2,839,055

The shipments of the same markets for the same week have been:

	1878.	1877.	1876.	1875.	1874.
3,503,917	2,850,428	3,822,151	3,800,314	2,528,468	2,920,706

The number of bushels and the percentages of the totals of the above shipments forwarded by rail were:

	1878.	1877.	1876.	1875.	1874.
700,479	470,422	1,339,094	1,362,611	799,288	605,387
21.7 p. c.	16.4 p. c.	35.1 p. c.	35.2 p. c.	31.6 p. c.	21.3 p. c.

The rail shipments have been as small but two weeks during the whole year 1878—once in April and once in June. They fell off also at this time last year.

For the same week ending Nov. 9, receipts at the seven Atlantic ports have been:

	1878.	1877.	1876.	1875.	1874.
4,527,683	4,980,768	2,708,964	3,191,155	1,797,450	3,487,942

Although the receipts for the corresponding week were larger last year, they were never at any time so large in any previous year. This year they have not been so small since July.

Of the Atlantic receipts this year, 48.6 per cent. arrived at New York, 16.6 at Baltimore, 15.9 at Philadelphia, 8.1 at Boston, 6 at Montreal, 4.6 at New Orleans and 0.2 per cent. at Portland. New York has not received so small a proportion of the total nor so small an amount since July.

Receipts and shipments at Chicago and Milwaukee for the week ending Nov. 18 were:

	Receipts.	Shipments.
Chicago.....	2,047,818	1,949,391
Milwaukee.....	658,500	653,100

Compared with the previous week there was a decrease at Chicago and an increase at Milwaukee—in the aggregate, a decrease.

For the same week receipts and shipments at Buffalo were:

	Receipts.	Shipments.
By rail.....	435,500	881,700
By water.....	1,682,850	1,516,419
Total.....	2,118,350	2,398,119

Receipts are about the same as for the previous week, but in shipments there is a great decrease by canal and a considerable increase by rail—in the aggregate a decrease of 20 per cent.

For the same week ending Nov. 18 receipts at four Atlantic ports were:

	1878.	1877.	1876.	1875.	1874.
New York.....	2,547,117	2,708,964	3,191,155	1,797,450	3,487,942
Philadelphia.....	761,000	761,000	761,000	761,000	761,000

Compared with the previous week there is an increase at every place, to more than 20 per cent. Compared with the corresponding week last year there is an increase of about one-third.

Freight on Iron Ore.

A correspondent of the American Iron and Steel Association who recommends New York City itself as a most favorable position for blast furnaces, gives the following as actual rates for carrying ores: Modoc and Marmora mines (in Canada) to Buffalo or Rochester—railroad freight, 26 cents; unloading, 10 cents; harbor dues, 25 cents; freight on Lake Ontario, \$1. Ores from Hudson River near Catskill (about 33 miles below Albany) to New York and Philadelphia—hauling two miles to river, 40 cents; weighing and loading on boats, 10 cents; scales and dock, 10 cents; freight from Catskill to New York, 50 cents; freight from Catskill to Philadelphia, \$1. The distance from Catskill to New York is about 115 miles.

THE SCRAP HEAP.

Railroad Manufactures.

The Rogers Locomotive Works, at Paterson, N. J., are running on orders for the St. Paul & Pacific, the Alabama Great Southern and some other roads.

The Bass Foundry & Machine Works, at Fort Wayne, Ind., are being enlarged by a new foundry, which will bring the capacity of the works up to 365 car-wheels per day. A new foundry is also being added to the Chicago branch of the concern. When this is finished, the three foundries at Fort Wayne, Chicago and St. Louis will have a capacity of 750 wheels per day.

Mr. Grant Wilkins has succeeded Mr. William Goodnow as Manager of the Atlanta (Ga.) Rolling Mill.

Arms, Bell & Co., manufacturers of bolts, nuts, screws, etc., at Youngstown, O., have been so crowded with orders that they are putting up a large addition to their mill.

The Lamotte Manufacturing Co., organized to build iron cars under the Lamotte patents, some time ago assigned its patents for ten years to the National Tube Works Co. Recently William O. Cooke, a stockholder in the Lamotte Co., brought suit to annul the agreement on the ground that it was a virtual abdication of its authority by the company. The defendant company insisted that it had carried out its agreement at a cost yet unpaid of over \$70,000, and that the contract was approved by three-fourths of the stockholders in the Lamotte Co. The case was tried last week in the New York Supreme Court and decision reserved.

A freight-train brake invented by William L. Card, of Somonauk, Ill., was tried recently on the Illinois & St. Louis road and is said to have worked very well.

The stockholders of the St. Albans (Vt.) Iron & Steel Co. have resolved to try and place a loan of \$150,000, secured upon the property of the company, to pay off the floating debt and provide working capital.

The Ashabula (O.) Rolling Mill was sold Nov. 18, and bought for account of the bondholders of E. H. Gilkey for \$11,300.

The Lake Shore & Michigan Southern Company has contracted with the Winslow Car Stove Co., of Cleveland, O., for 400 of its safety tanks and stoves. A number of tests were made by the Lake Shore officers, and when stoves were overturned and broken the Winslow apparatus invariably extinguished the fire in from five to ten seconds by 16 gallons of water that the tank contained.

Bridge Notes.

Hussey, Howe & Co., of Pittsburgh, have orders for the steel for a swing-bridge over the North Branch of the Chicago River for the Chicago & Northwestern road.

The orders for the wrought-iron work to be used in the re-

building of the Pennsylvania Railroad sheds in West Philadelphia, which were blown down by the recent big wind, were divided equally between the Edgemoor Iron Works, the Philadelphia Bridge Works (Croford & Sayler) and Messrs. Jones & Benner.

We have received some particulars concerning the new steel bridge which is being erected for the Chicago & Alton Railroad over the Missouri River at Glasgow, Mo. Gen. Wm. Sooy Smith, of Chicago, is the engineer in charge. The bridge is to have five spans, and is to be entirely of steel made by the Hay process. Not even a nut is to be made of iron. This is believed to be the first large bridge ever built in which steel alone is used. The piers are already finished and ready for the superstructure, work upon which is progressing rapidly. The Hay process, the invention of Mr. A. T. Hay, of Burlington, Ia., consists in thoroughly decarbonizing iron, by the Bessemer or other process, then re-carbonizing to the proper extent by adding along with the spiegel-eisen a portion of a matte containing several metals and metalloids, manufactured and furnished by Mr. Hay. An additional portion of the matte is added to the steel when it is in the ladle. The matte, together with the spiegel-eisen, are added, so as to give to the iron the requisite amount and kind of steel-making elements. Messrs. Hussey, Howe & Co., have obtained the exclusive right to use this process. It is claimed for it that the tensile strength of the Hay steel is from 90,000 to 100,000 lbs. per square inch, with an elastic limit from 55,000 to 60,000 lbs., and a ductility such that the sectional area reduces at least ten per cent. before fracture. The steel for the Glasgow bridge is being made at the Edgar Thomson Bessemer Steel Works, and is rolled to shape by Hussey, Howe & Co. The eye-bars are being rolled by Mr. Andrew Kloman, at the old Superior Rolling Mill, in a peculiar universal mill of his construction, a description of which we hope to give in a future issue. The bridge is being erected by the American Bridge Co., of Chicago.—*American Manufacturer.*

A telegram from La Salle, Ill., dated Nov. 14, says: "The work of narrowing the gauge and repairing the track of the La Salle & Peru street railway having been completed, a practical test of the trustworthiness of the eastern bridge was made this morning in the presence of the Mayor and Common Council of Peru. A car-load of spelter weighing fifteen tons, was drawn upon the east span, and crushed it. As the bridge was new this result was not expected."

Notes.

On the basis of the claims for damages presented to the Old Colony Company, it is thought that the four cars wrecked at the Wollaston accident must have contained about 1,100 people. Those who can't raise a respectable-sized bruise claim to have lost their hats and overcoats.

Sometimes the services of a civil engineer are cheap at twice the money. A Henderson County farmer worked four days digging a ditch to drain a bit of low meadow of his own into a big pond on another man's farm. And when the ditch was opened the pond just walked right into the meadow and located about 20 acres of swamp right where the hay used to grow. And the farmer was just the maddest man.—*Burlington Hawkeye.*

This is the way they talk about a man at the Aurora shops of the Chicago, Burlington & Quincy, simply because he digests his victuals, and puts his nourishment where it will do the most good: "Washburn's engine, the new 32, will be out of the paint shop Tuesday. For the accommodation of his giant proportions we should mention that the new cab has been made much higher and broader and longer than any ever before seen, and in this it is believed he can stow himself away with some degree of comfort. With the ordinary cab, Washburn is compelled to occupy about half the tank."

The fare to New York is now but \$4, and yesterday a gentleman who enjoys peculiar relations with one of the roads, approached one of its high officials and said, "Give me a package of passes to New York." "A package of passes?" queried the astonished official. "What the devil do you want a package of passes for?" "Well, I want to go to New York," was the reply, "and the fare is so cheap that I would hardly take it as a compliment to travel on a single pass."—*Cincinnati Enquirer.*

New Pattern 85-lb. Rail.

We understand that the Midland Railway Company, ever in the van of progress, will, with the commencement of next year, adopt a heavier rail than any now in use on their or other lines. The new rail will be bull-headed as to section, and will weigh 85 lbs. to the yard. Neither this section nor weight would have been generally favored a few years ago, but is now absolutely required, owing to the enormously increased weight of rolling stock. The Midland has especial reason to be *au fait* in this respect, owing to its adoption of the Pullman cars, which are by far the heaviest vehicles running in this country. A few years ago 50 and 60-lb. rails were very general, and double-headed sections were in pretty nearly universal use. In course of time, however, the engineers and others took a dislike to turned rails, alleging that no reversed metal ever had a good face, owing to the rust which was almost invariably found to have accumulated on the place where it had been fixed on the sleepers. For this and some minor reasons the double-headed article has been gradually discarded, and the flat-footed one, no matter which of the two hundred and odd "heads" it may have, reigns supreme. The alteration is worthy of being noted as an example of the changes wrought in the course of a few years in what may be currently deemed the best thing attainable in any given branch of science or trade.—*London Ironmonger.*

Bridges of Old Rails.

Mr. George Bartle, Master of Bridges on the New Jersey Midland road, intends to try a bridge made of old rails on a plan designed by himself, with cast iron joint boxes. The road has a great number of short bridges, most of which were originally built of wood, and will have to be renewed or replaced within the next few years.

Block Signals on the Fitchburg Railroad.

A section of the Fitchburg Railroad out of Boston has recently been equipped with block signals, which are thus described by the Boston Globe: "The signals have been put up by the Union Electric Signal Co. on trial, the exhibition of their working yesterday being very satisfactory. The method of signaling is as follows: A division of track is marked with signal-posts set out by the side of the track. When a train enters a section a signal of danger is displayed, which remains in position till the train has passed over the section, which, as now used, is one mile. A danger signal displayed shows that a train is on that section, and calls for a stoppage of a train that may be moving over the track. These signals are arranged in this wise: An upright post bears on the top a swinging disc and also a light, with a swinging glass in front, which operates as does the disc by the action of electricity. To signal danger the disc is swung open, as is also a plate, made to show a red light, when the lamp employed is lighted, thrown before the lamp. When the disc is closed a white light will be shown. These signals are made after the following manner: At one end of the section is placed a battery connected with the rails; at the other an

electro-magnet governing the signal, making a complete circuit using the entire length of track in the section. When a train enters the section it shortens the circuit, for the electricity passes through the wheels and axle of the locomotive or car. It takes this course in preference to passing through the electro-magnet, which offers greater resistance, and it immediately drops the signal to danger, and it cannot be restored till everything is off the section. When the train passes off it restores magnetism in the magnet of the signal, showing safety. One of the most ingenious arrangements of the system is the switch signal. By an ingenious piece of mechanism a danger signal is displayed exactly similar to the section signal, if a switch is not locked. No matter whether it be closed or not, it must be locked, else the train will be brought to a stand-still if orders are followed and the signal is observed. Springs are used, and all is connected with the battery, and if the switch is not locked it throws off a handle, which breaks the circuit and at the same time, by a wire, shuts it, so that no magnetism can remain in the magnet of the signal. The spring throws the circuit-breaker out of connection, likewise showing the danger signal. By using this simple contrivance there can be no accidents from a misplaced switch. Only one cell of batteries is used on a section of a mile and no local batteries. The expense by this method of signaling is very small, costing very little indeed after it has been established."

Value of Ohio River Transportation to Pittsburgh.

The market reporter of the *Iron Age* at Pittsburgh, writes Oct. 29, in introducing his quotations:

"General business has improved materially since the date of our last report, owing to the resumption of river navigation giving us cheap transportation to all the leading points of distribution, both West and South. Notwithstanding the remark attributed to Henry Clay, that the Ohio River is dried up one half of the year and frozen up the other half, Pittsburgh and other large cities along its borders would not like to dispense with it. The bulk of our heavy freighting is still done by rivers. When the water is low, as was the case during the greater part of September and October, it is held back until navigation is resumed. It became evident on Thursday last that there would be water enough to let out steamers, and ever since then business above the landing has been quite active. The shipments of iron, glassware, steel, nails, wagons, plows, as well as Pittsburgh manufactures generally were heavy, and the indications are that our steamers will have all they can do from now until navigation is suspended by ice, which usually occurs about the last of December. On Saturday last we had a regular packet out Cincinnati and three boats left for St. Louis, taking chiefly Pittsburgh manufactures. The fact is, the difference in the cost of freighting by river as compared with rail, is the means of bringing a great deal of business here that otherwise would be directed to other points, as our manufacturers, if dependent on rail transportation alone, could not successfully meet competition from other points. This being the case, it is not strange that our people are anxious to have the river improved."

OLD AND NEW ROADS.

Algiers & Timbuctoo.—A French engineer named Duponchel, has made a report on the project of a railroad across the Desert of Sahara. The projected road would run from Algiers to Timbuctoo, a distance of 1,500 miles. M. Duponchel stated that the principal portion of the line would rest during nearly its whole extent on layers of sand, and toward the end on primitive volcanic rocks, granite, gneiss, etc. No mountainous obstructions would have to be encountered. The average heat does not appear to exceed 23° or 24° Centigrade (73° or 75° Fahrenheit), but account must be taken of the great variations which occur in the 24 hours. For instance, occasionally, a very cold night succeeds a temperature of 40° Centigrade (104° Fahrenheit) in the day time. The great difficulty to be overcome would be the want of water, which is not to be procured in that region. M. Duponchel calculates that for three trains daily the amount of water required would be 4,000 cubic meters, and that the engineering science of the day is quite sufficient to supply even a much greater quantity at the requisite points.

It may be added to what M. Duponchel says that one train a year would much more than suffice for the traffic, actual or probable, between Algiers and Timbuctoo.

Ashtabula & Youngstown.—This company, successor to the Ashtabula, Youngstown & Pittsburgh, has executed a mortgage to secure an issue of \$1,500,000 new 6 per cent. bonds. The new bonds are to replace the old issues in accordance with the agreement of reorganization. The company has also made a new contract with the Pennsylvania Company, which works the road.

Atchison Union Depot.—The Atchison Union Depot & Railroad Company has been incorporated to build a union depot in Atchison, Kan. The capital stock is to be \$100,000. The incorporators are B. F. Stringfellow, L. W. Towne, W. F. Downs, C. E. Styles and D. E. Farnsworth.

Atlantic & Great Western.—Receiver Devereux reports to the Court for September receipts of \$340,149.03; expenses, \$260,876.94; balance, \$79,272.09.

The *Cleveland Herald* of Nov. 19 says: "The annual meeting of the road-masters of the Atlantic & Great Western Railroad was held at Meadville recently. After the meeting adjourned the entire party came to Cleveland. The reports of the various masters show that the road, as far as its bed and bridges are concerned, is in a first-class condition. During their stay in the city the masters called upon the Receiver, Mr. J. H. Devereux, who said that recently a most thorough examination of the road had been made by the English reorganization trustees and others of experience, all of whom had pronounced the road in the best condition of any they had seen in the United States. They had noticed much improvement since their first visit two years ago, and it would be a gratification to report this to the Erie trustees in London, and would aid them in consummating the proposed lease. Speaking of the late floods, which had caused a destruction of railroad property, Mr. Devereux said the road-masters deserved the highest praise for their prompt, energetic and efficient work."

Testimony is now being taken by a commissioner in the foreclosure suit on the claim of Bischoffsheim & Goldschmidt to a lien upon the property to the amount of certain coupons paid by them in January, 1874, they advancing the money and holding the coupons as security. The claim is opposed by the trustees under the first mortgage and also by the Ohio mortgage bondholders. The company claims an offset, charging that Bischoffsheim & Goldschmidt have not accounted fully for the proceeds of bonds sold by them.

Atlantic & Gulf.—It is reported that the Central Railroad Company of Georgia has bought all or nearly all of this company's consolidated or second-mortgage bonds. The purchase will give the Central control of the foreclosure suit now in progress, and of any new company that may be organized, should the foreclosure be completed.

Baltimore & Delta.—At a recent meeting of the board

in Baltimore, the proposals for grading and masonry work on 32 sections of the road, which had been received from 72 bidders, were referred to the executive committee and Major P. P. Danbridge, Chief Engineer, with instructions to examine them and report to the board. The purchase of seven miles of road-bed from Swann Lake to Gunpowder Lake for \$18,500 was ratified. The board adjourned to meet in Baltimore on the 29th instant, when the report upon the proposals for grading, etc., will be received and the contract awarded.

Bedford, Springville, Owensboro & Bloomfield.—Indianapolis papers report the appointment of a receiver for this road; by what Court or on whose application is not stated. The road is of 3-ft. gauge and extends from Bedford, Ind., to Switz City, 41 miles.

Boston & Albany.—This road has now a train running in the New York & Boston Line mounted on 42-in. wheels. The train consists of one baggage car, No. 55; one smoking car, No. 172; two passenger cars, Nos. 31 and 39, and two drawing-room cars, the City of Boston and City of Springfield. The train runs one side of the fast express, leaving Boston Monday, Wednesday and Friday in each week, and New York on the alternate days.

Buffalo, New York & Philadelphia.—This company is now offering new 7 per cent. bonds for sale or exchange, for the purpose of retiring its 10 per cent. bonds, the right to pay off those bonds after five years having been reserved. Interest on the 10 per cent. bonds has always been punctually paid. The company's circular states that last year's net earnings showed a considerable surplus, after paying all charges, and that a considerable number of holders of the old bonds have signified their intention of exchanging for the new bonds. Those not exchanged will be offered for sale. Mr. E. C. Spaulding, of Buffalo, is conducting the negotiation for the company.

Canada Southern.—This company makes the following statement to the New York Stock Exchange with its application to have its stock placed on the list:

Stock	\$15,000,000
New first-mortgage bonds, actual issue	\$10,862,686
held to exchange for \$537,500 old firsts at par and \$354,565 seconds at 31½%	649,157
Unpaid vouchers and wages	388,178
Sundry accounts payable	624,087
Income account	394,905
Total	\$27,919,013
Construction	\$22,830,433
Stock of controlled lines	1,387,125
Bonds	3,215,751
Stock N. Y. Central Sleeping Car Co.	25,000
Materials on hand	287,150
Cash	164,534
	27,919,013

The stocks and bonds held are \$225,000 stock and \$940,000 bonds, Canada Southern Bridge; \$858,000 stock and \$1,451,256 bonds, Toledo, Canada Southern & Detroit; \$100,000 stock and \$600,000 bonds, Erie & Niagara; \$204,125 stock and \$189,495 bonds, Michigan Midland & Canada; \$35,000 bonds, Chicago & Canada Southern. The following shows the application of the company's new first-mortgage bonds:

Total issue authorized	\$14,000,000
Applied to refunding scheme, as above	\$4,511,843
Held for purchase of Canada Southern Bridge, Toledo, Canada Southern & Detroit and Michigan Midland & Canada bonds	145,062
	11,657,505

Balance unused \$2,342,495. The balance is to be used to provide for \$624,087 accounts payable and for the general purposes of the company. Interest on the bonds is guaranteed by the New York Central & Hudson River Company.

Central Branch, Union Pacific.—In the matter of the conflicting claims of this company and the Kansas Pacific to certain lands in Kansas which come within the limits of both companies' grants, the Secretary of the Interior has decided that the grant to each company was made by the same acts of Congress, imposing upon both of them the same conditions. Therefore they are contemporaneous in their origin, and do not depend for their rights upon priority of location or construction. He therefore decides that the lands situated within their overlapping land-grant limits should be held to inure jointly to both companies. In view of the recent decision in the Dwyer case the Secretary directs that the subject of transferring to the government the title to these lands be reserved for further consideration.

Chicago & Alton.—Track on the Kansas City Extension is now laid to Higginsville, Mo., 110 miles west from Mexico. This is within 50 miles of Kansas City, and is 35 miles beyond Marshall, the last point noted, and 55 miles from Glasgow, the crossing of the Missouri River. Work is being pressed forward on the road and also on the bridge at Glasgow.

Chicago, Burlington & Quincy.—The company has let a contract to Wells, French & Co., for 500 additional grain cars, which will make 4,000 new freight cars made for this company within two years. In October there passed over this road from Aurora (where it receives the easternmost of its branches) to Chicago 581 freight trains with 19,775 loaded cars, 4,590 of which contained stock. This is an average of 20½ trains and 732 cars daily, and an average of 35 loaded cars per train.

Grading has recently been completed for an extension of the second track between Arlington and Malden, Ill., a distance of 15 miles.

The October pay-roll for the Aurora shops had the names of 1,123 men—678 in the locomotive department and 447 in the car department.

Chicago, Milwaukee & St. Paul.—The track on the Iowa & Dakota Division is now laid to a point 15 miles west of the late terminus at Sheldon, Ia., where it is expected to stop for the season. It is said that surveys are to be made for a line across Dakota to the Black Hills as an extension of this division.

There is also talk of building a branch from Springville, Ia., south through Central and Wanbeck to Quasqueton in Buchanan County, about 50 miles. The report is rather a doubtful one, however.

Denver & Rio Grande.—An agreement between this company and Louis H. Meyer, the sole surviving trustee under its \$14,000,000 mortgage, was week before last filed with the Secretary of State of Colorado. The execution of the mortgage to John Edgar Thomson, of Philadelphia, and Samuel M. Felton and Louis H. Meyer, of New York, as security for \$14,000,000 of bonds, is recited. Propositions were made to the bondholders on April 13, 1877, to the effect that no more bonds should be issued under that mortgage than should be required to complete the road to Alamosa, and fund certain ten-year certificates designated. The bondholders accepted the proposition, and it is now proposed

to limit the bonds to the amount already issued for the purpose of enhancing their value. It declares that \$6,382,500 of the bonds have been issued under that mortgage and no more, and agrees that no more shall be issued.

Detroit & Bay City.—The track on the new branch from Vassar, Mich., to East Saginaw, is now laid to a point 12 miles west by north from Vassar, and work is progressing steadily.

Eastern Shore.—It is stated that at a recent meeting the directors of this company decided not to oppose the foreclosure suit begun in the United States Circuit Court, but to consent to the decree.

Georgetown, Leadville & San Juan.—This company has filed articles of incorporation in Colorado, to build a railroad from Georgetown, the terminus of a branch of the Colorado Central road, south by west to Leadville, about 70 miles, with an extension from that place into the San Juan mining region. Capital stock is fixed at \$5,000,000. The incorporators are E. L. Berthoud and C. C. Welch, of Colorado; Sidney Dillon, Jay Gould and Russell Sage, of New York, and Frederick L. Ames, of Boston. All of them are interested in the Colorado Central and Union Pacific roads.

Great Western.—At the half-yearly meeting in London, Oct. 30, Mr. George Smith, formerly a director and Vice-President, moved that the directors' report for the half-year ending with July last be not received or adopted, and that a committee of investigation, to consist of two of the Auditors (Mr. John Young and Mr. Thomas Adams), two former directors (Mr. Thomas Faulconer and Mr. Paul Margeson), Mr. John M. Douglas, and the mover, be appointed, to report within a month, and to confer with the Grand Trunk, and with Mr. Hugh J. Jewett and Mr. Wm. H. Vanderbilt. This motion was rejected by a vote of 7 for and 39 against. The arrangement made with the Canada Southern under the Scott arbitration was submitted to the stockholders, and approved, and the directors were "authorized to make such modifications of the arrangement in question as the circumstances may from time to time require."

Illinois Central.—It is said that the board of directors has decided to have surveys made to determine the best and shortest route for a branch from this road to East St. Louis. This is intended as an offset to the Wabash's projected line to Chicago.

Intercolonial.—The shops of this road at Moncton, N. B., now employ 400 men. During the past year they have built one new mogul freight engine, 380 box cars and 20 Wickes refrigerator cars, besides rebuilding 10 first-class and several second-class passenger cars. Three more mogul engines are now under way.

Fast time is made over this road, which is very substantially built. The trains carrying the English mail make the run of 571 miles from Halifax to Riviere du Loup at the rate of 45 miles per hour. Some time ago the Quebec express made a run of 37 miles in 43 minutes, including one stop.

Lehigh & Lackawanna.—In the suit of Chapman and others against this company, Charles Brodhead and others, the Court has overruled a demurrer filed and ordered the defendants to answer the bill before Dec. 1. The allegations in plaintiffs' bill are that Brodhead, acting in complicity with the co-defendants, while President of the Lehigh & Lackawanna Railroad, negotiated for a contract for the extension of the said road at a price of \$100,000 in the face of the fact that an offer had been made by a responsible party to build and finish the said extension for less than \$50,000. The road was to run from Bath to a point near the Wind Gap, a distance of about 10½ miles. The plaintiffs are stockholders in the said railroad and called on Mr. Clark, who is now President of the road, successor to Mr. Brodhead, and asked to be permitted to see the books of the minutes of the company, which, it is said, Clark peremptorily refused to allow them to do. This was before the bill was filed. The object in asking for the minutes was to ascertain the exact time when Mr. Brodhead resigned, and also the time when the contract was concluded. The prayer of the bill is that the Lehigh & Lackawanna Railroad Company produce their book of minutes and the contract entered into between the company and Mr. Brodhead, and that the defendant be restrained from negotiating any of the bonds of the said company issued in pursuance of the contract with Brodhead.

Memphis, El Paso & Pacific.—Mr. John A. C. Gray, Receiver of the property of this defunct corporation, gives notice that, under an order of the United States Circuit Court in the case of Forbes and others against the company, he will sell in New York, Nov. 23, 128,690 acres of land in Callahan, Eastland, Clay, Brown, Stephens, Cooke, Jones, Wilbarger, Dimmit and Baylor counties in Texas; also 15 lots of land on 132d street in New York. The sale will be held at the Exchange Sales Room, No. 111 Broadway, at noon.

Mexican Railroad Prospects.—Mr. Foster, the United States Minister to Mexico, in the course of a communication chiefly devoted to a discussion of the opportunities for increasing commerce with that country, says that "this Government can do something toward the improvement of communication with Mexico by steamships, but that without an international railroad to the capital no considerable trade can be maintained. Under this head he aims to establish the following points: That the Mexican Government will not consent to any treaty, stipulation or other international agreement for the joint protection of such a road, and that it requires all the employees and the capital of the company formed for that purpose to become Mexican for all purposes of the enterprise; that the last Congress positively refused to grant a charter for an American company, and the present Congress has manifested the same opposition; and that the Mexican Government, owing to its financial condition, is absolutely unable to pay any subsidy for the construction of the road."

Montclair & Greenwood Lake.—In the case of Ramsdell against the town of Montclair, the United States Circuit Court at Trenton, N. J., has decided that the bonds issued by Montclair in aid of this road were legally issued and are valid, and the interest (to recover which suit was brought) must be paid. The town's defense was illegal issue and unconstitutionality of the law authorizing the towns on the line to issue bonds. The Montclair case was a test one and those of the towns of Kearney and Pompton and the city of Newark as representing the annexed town of Woodside will doubtless be decided in the same way.

Nashville & St. Louis.—This company has been organized to build a railroad from East St. Louis southeast to the Ohio River at a point below Shawneetown, Ill., to be called Grand City. A similar organization in Kentucky is to extend the road to Nashville, Tenn. The stock is fixed at \$2,000,000.

New York & Oswego Midland.—The plan prepared by the joint committee of holders of Receiver's certificates and bonds is substantially as heretofore noted. It provides for the sale of the road and the organization of a new company, which is to issue \$300,000 bonds, \$200,000 preferred

stock and \$13,000,000 common stock. The bonds are to pay the expenses of foreclosure and reorganization, and are to be taken by the holders of certificates and the bondholders. The preferred stock is to bear 6 per cent. interest, if earned, and is to be issued for the Receiver's certificates; the common stock to be issued to holders of the present first-mortgage bonds.

New York, Lake Erie & Western.—The following notice was published in London, Nov. 2, by J. D. Ayers, Secretary to the Reconstruction Trustees:

"A cable from New York states that up to the close of business yesterday there had been 269,188 ordinary shares paid upon there, and 21,858 preference shares. These figures, added to the numbers paid upon here, give the following totals: Ordinary shares about 762,000, and preference about 80,700, leaving about 18,000 ordinary shares not paid upon, and about 4,000 preference shares."

Ohio & Mississippi.—Notice is given to first-mortgage bondholders that, by order of Court, their July interest will be paid Nov. 30. The notice of payment contains the following: "No interest will be paid on the coupons, as the order of the Court reserved for future determination the question of paying such interest. The coupons are to be surrendered and canceled, but the names of the owners will be taken and reported to the Court as a basis for the calculation of interest, if the Court shall hereafter allow it."

Portland & Ogdensburg, Vermont Division.—A majority of the bondholders of the Portland & Ogdensburg Railroad Company, Vermont Division, having assented to the plan of reorganization proposed by the committee appointed at the Springfield (Mass.) meeting, its provisions will now be carried into effect, and the bondholders have been called upon to deposit their bonds with the Union Trust Company. Messrs. Louis Fitzgerald, of New York; George E. B. Jackson, of Portland, Me.; Chas. W. Hassler and John J. McCook, of New York; Wm. S. Shurtleff, of Springfield, Mass.; and William H. Rhawn, of Philadelphia, are the trustees under the bondholders' agreement. The new company will be organized with a first-mortgage debt of \$1,250,000, and with preferred and common stock. The new first-mortgage bonds will be apportioned as follows: For first-mortgage bonds whose present or former owners have not assented to the agreement for the issue of the preference bonds, shall be given 51 per cent. of their par value in new bonds; for first-mortgage bonds, whose present or former owners have assented to the agreement for the issue of the preference bonds, shall be given 41 per cent. of their par value in new bonds; for preference bonds, actually issued, shall be given 62½ per cent. of their par value in new bonds. Preferred stock will be issued to all bondholders for the remainder of the par value of their bonds and interest thereon, matured and unpaid to the first day of May, 1878, except that in those cases where bonds have been hypothecated for loans, such preferred stock shall be issued for only the remainder of the loan and interest to the first day of May, 1878. Preferred stock may be issued in settlement of all other lien claims as may be determined by the trustees, and also for matured and unpaid coupons due on or prior to May 1, 1878. To holders of unsecured claims against the company will be issued new common stock in full settlement of their claims, in such proportions as may be decided upon by the above-named trustees.

Profile & Franconia Notch.—Contracts for the work on this road have been let to James F. Kiernan, of Chelsea, Mass., and M. H. Smith, of Tilton, N. H. The road is to extend from the Boston, Concord & Montreal at Bethlehem, N. H., to the Profile House in the White Mountains. It will be 9½ miles long, with an average grade of 80 feet to the mile, three miles being 116 feet to the mile. The company hopes to have cars running in time for next year's summer travel.

Railroad Incorporations in Illinois.—Hon. George S. Harlow, Secretary of State, of Illinois, reports that since the general law of that State regarding the incorporation of railroads went into effect, which was March 1, 1872, down to Oct. 1, 1878, 136 corporations have organized under it.

Securities on the New York Stock Exchange.—The following securities have recently been placed on the list at the New York Stock Exchange:

Canada Southern stock, amount authorized and issued, \$15,000,000.

Central, of New Jersey, adjustment mortgage bonds, amount \$5,550,000; dated May 1, 1878, payable May 1, 1903; interest 7 per cent., coupons payable May 1 and Nov. 1.

Pullman Palace Car Co., new 7 per cent. debenture bonds, amount \$1,000,000; dated Oct. 15, 1878, payable Oct. 15, 1888.

Springfield, Jackson & Pomeroy.—This company has more traffic than it can carry with its present equipment, which it is therefore increasing. The coal mines in Jackson County give it a large part of its traffic. This road is 108 miles long, and there are but two longer ones of 3 ft. gauge in America.

Utica & Black River.—At the annual meeting in Utica, N. Y., Nov. 13, the committee appointed at the last meeting of stockholders to examine into its affairs and management, presented a report, which states that they have devoted considerable time and attention to this matter, that they find the books and accounts kept in a clear and satisfactory manner, and that the stockholders are to be congratulated in having their affairs managed in the careful and economical manner that is exhibited. On motion of Addison C. Miller, the report was accepted and ordered printed with the usual annual report, and the thanks of the stockholders were extended to the committee for the able and satisfactory manner in which it has performed its duties.

The annual report showed a considerable gain in net earnings.

Valley, of Virginia.—At the annual meeting in Staunton, Va., Nov. 13, President Keyser stated that the business of the road had been injured by the failure to make satisfactory agreements with the Chesapeake & Ohio for exchange of business at Staunton. The operations of the 26 miles of completed road for the year ending Sept. 30 was as follows:

Gross earnings (\$1.565 per mile)..... \$40,601.51
Expenses (\$6.90 per cent.)..... 35,630.10
Net earnings (\$1.95 per mile)..... \$5,061.41

The report stated that the finance commissioners of the city of Baltimore in their action upon the resolution passed at the last annual meeting in regard to issuing a mortgage with a view of constructing the road to Salem had, owing to the present condition of the money market, considered it inexpedient to take any action toward this end until a later date. The differences in the account with the Baltimore & Ohio Railroad Company, the report states, have all been adjusted by arbitration, the latter company having credited the Valley road with the sum of \$29,587 in full settlement. The report further stated that the obligations of the com-

pany given to the contractors in settlement of the final estimates for construction, having all matured, had been met by the Baltimore & Ohio Company and that the full amount is now a cash advance to the Valley company; that the bonds held as security by the Baltimore & Ohio are sufficient to liquidate this indebtedness, provided they can be sold at their proper value, but that the action of some of the citizens of Rockbridge had been so injurious to the credit of the county securities as to prevent them being negotiable at satisfactory prices; that while there had been no default on the interest payments, the constant agitation of the subject had considerably depreciated the value of the county bonds; that the Baltimore & Ohio Company had advanced the money to pay the contractors in a liberal spirit to save the Valley Company from threatened bankruptcy and foreclosure, and that it was hoped the agitation of the question in Rockbridge County would cease, so as to reestablish the credit of the county and thus enable the company to market the bonds and return the amount of indebtedness.

The report was referred to a committee, which reported at an evening session that they had found the business of the company to have been conducted as economically as could be expected under existing arrangements. The committee appointed for the purpose of making a report regarding the further construction of the road failed to agree in any one particular. Major Dorman, of Rockbridge County, submitted a proposition signed by himself and all the Valley proxies addressed to the Baltimore & Ohio Company and the city of Baltimore, looking to a dissolution of the existing arrangement by a division of the road as follows: The Valley interests in the road to surrender all claims upon the completed portion of the road between Harrisonburg and Staunton, provided the city of Baltimore and the Baltimore & Ohio Company will agree to return to the interests south of Staunton the \$214,000 in bonds held by the latter company as collateral for the indebtedness due it, and the counties and towns in the valley to be allowed full possession of the uncompleted portion between Staunton and Salem. The Staunton proxy would only agree to sign subject to the ratification of the City Council of Staunton. Mr. Keyser expressed himself as satisfied that the Baltimore & Ohio Company would not for one moment entertain this proposition, if for no other reason than its unwillingness to surrender the securities held by it as collateral for the indebtedness.

The meeting then adjourned till the following day, when a revised proposition for a division of the road was presented covering the same ground, but more in detail than the one presented yesterday, which proposition was referred to the proxies of the Baltimore & Ohio and city of Baltimore, to be submitted by them to their principals. The meeting then adjourned without further action.

Viroqua.—Work is now actively in progress on this road, which is to extend from the Chicago, Milwaukee & St. Paul at Sparta, Wis., southward to Viroqua, about 30 miles. It is intended to have the road finished early in the spring.

Wabash.—A change in management has taken place, Commodore C. K. Garrison, President of the Missouri Pacific, succeeding Mr. James A. Roosevelt as President of this company. There have been also several changes in the board.

It is reported that the company intends to secure a line to Chicago, and for that purpose is negotiating for the purchase of the Chicago & Paducah road. If the purchase is made, it is said that the Paducah road will be extended to Chicago on the line projected some years ago by the Decatur & State Line Company.

Yankton & Milwaukee.—Arrangements are being made to organize a company by this name to build a road from Yankton, Dak., to Canton, about 50 miles, to connect with the extension of the Iowa & Dakota Division of the Chicago, Milwaukee & St. Paul.

ANNUAL REPORTS.

Baltimore & Ohio.

The lines worked by this company during the year ending Sept. 30, 1878, which is covered by the 53d annual report, were as follows:

	Miles.
Main Stem, Baltimore to Wheeling.....	379.00
Camden and Locust Point Branches in Baltimore.....	6.50
Frederick Branch.....	3.50
Valley Branch, Harper's Ferry to Harrisonburg.....	101.00
Metropolitan Branch, Point of Rocks to Washington.....	43.00
Alexandria Branch (Wash. City & Pt. Lookout R. R.).....	12.50
Total Main Stem and branches.....	545.50
Washington Branch, Relay House to Washington.....	31.00
Parkersburg Branch, Grafton to Parkersburg.....	105.40
Central Ohio Division, Bellaire to Columbus.....	138.60
Lake Erie Division, Newark to Sandusky.....	116.00
Chicago Division, Chicago Junction to Chicago.....	263.00
Wheeling, Pittsburgh & Baltimore R. R.....	32.00
Newark, Somerset & Straitsville R. R.....	44.00
Pittsburgh Division, Cumberland to Pittsburgh.....	150.00
" " Fayette County Branch.....	14.00
" " Mt. Pleasant Branch.....	10.00
Total.....	1,449.50

In addition, the Washington County Railroad (Junction to Hagerstown, 24.25 miles) was worked from Oct. 1, 1877, to Jan. 1, 1878, three months, its operations for that period being included in the Main Stem and branches, making the average mileage under that head 551.56 miles for the year.

President Garrett's report, the only portion of the report yet published, says:

"The sinking fund, for the payment of the loan of the city of Baltimore, which was originally \$5,000,000, increased during the year \$103,487.91, making the payment in advance, and in reduction of that loan, which will mature in 1890, \$2,061,908.91.

"The payments for investments on account of the sinking fund, for the redemption of the sterling loans due in 1895, 1902, 1910 and 1927, during the year amounted to \$458,048.51, which at \$4.84 per pound sterling, make £94,638 2s. 5d.

"The principles upon which the sinking funds of the Baltimore & Ohio Railroad Company are based will cause the entire indebtedness with which they are connected to be met, by the period of the maturity of the respective loans, from the annual appropriations made for these funds, together with the interest accruing from their accumulations.

"In accordance with the agreement with the city of Baltimore, the third annual payment, namely, \$40,000 of the principal of the bond for one million dollars, given for the purchase of the interest of the city in the Pittsburgh & Connellsville Railroad Company, has been made, thus reducing this obligation to \$880,000.

"The investments for the sinking funds, and the payment of part of the principal of the bond for the purchase of the interest of the city of Baltimore in the Pittsburgh & Connellsville Railroad, amount for the fiscal year to \$601,536.42.

"Of the mortgage loan, payable in 1880, \$120,500 have

been anticipated, leaving \$579,500 to be paid; \$790,000 have been paid in anticipation of the loan, redeemable in 1885, which was originally \$2,500,000, leaving the remainder of this loan \$1,710,000.

"Of the bonds for \$500,000, indorsed by the Baltimore & Ohio Railroad Company, under the contract of July 18, 1864, of the Northwestern Virginia Railroad Company, due in 1885, \$300,000 have been anticipated, reducing the sum unpaid to \$200,000. Upon this road, now known as the Parkersburg Branch, which cost upward of nine millions of dollars, the \$140,000 stated is the only remaining mortgage indebtedness—the Baltimore & Ohio Company having paid off the entire first and second mortgages, amounting to \$2,500,000, and \$300,000 of the third mortgage, making the aggregate of these payments \$2,800,000."

"Payments to the various sinking funds during the year were \$687,087.61; total payments and investments for the various sinking funds have been \$5,836,234.85. The report further says:

"The subjoined statements exhibit the reduction of the indebtedness stated during the fiscal year:

REPORT OF OCT. 1, 1877.	
Sterling debentures, due in 1878, 1880 and 1881.....	\$3,872,000. 0
Bills payable.....	2,967,491.6
Obligations maturing Jan. 1, 1878, and loans.....	1,535,689.06
Total.....	\$8,375,180

REPORT OF OCT. 1, 1878.	
Sterling debentures, due in 1880 and 1881.....	\$2,420,000.00
Bills payable.....	2,563,302.29
Sterling obligations and loans.....	2,554,959.33
Total.....	7,538,261.62

Showing a reduction during the year of..... \$856,919.11
Add payments on account of the principal of debt and of the sinking funds during the fiscal year..... 687,087.61

Making..... \$1,544,006.72
Add payment of cash dividend on Nov. 15, 1877..... 304,320.00

Showing payments and investments for the objects stated, during the year, from the net earnings of the company, of..... \$1,938,332.72

"On the 1st of January, 1878, \$350,000 of debentures were paid in London. These debentures were negotiated in January, February and March, 1875, when the premium on gold was 14½ to 17 per cent. In paying this debt an advantage to the company was realized, in consequence of the decline in the premium on gold of upward of 12 per cent.

"A semi-annual dividend of 3 per cent. upon the capital stock was paid in cash on the 15th of November, 1877, and on the 15th of May, 1878, a stock dividend was made of 4 per cent.

"In view of the indebtedness incurred by the company having furnished the means to construct the Baltimore Short Line and the Cincinnati & Baltimore Railroads and for the aid of the Marietta & Cincinnati and Pittsburgh & Connellsville companies, and other important connecting lines, it was deemed wise to use the net earnings of the road for the reduction of the indebtedness. A dividend of 4 per cent., representing part of these earnings, was therefore declared in stock and the sum used in the payment of the said indebtedness."

President Garrett stated, verbally, at the meeting, that since September, the floating debt had been further reduced by more than \$1,000,000.

The statements of traffic given are as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Tons through freight carried.....	1,149,400	1,047,045	I. 102,354	9.7
Barrels flour carried to Baltimore.....	778,211	641,702	I. 136,509	21.3
Bushels wheat carried to Baltimore.....	9,365,233	2,500,600	I. 6,864,633	274.5
Bushels corn carried to Baltimore.....	10,164,985	13,290,714	D. 3,125,729	23.5
Bushels of all grain to Baltimore.....	20,639,654	16,379,861	I. 4,259,793	25.7
Tons lumber carried to Baltimore.....	41,270	53,720	D. 12,450	23.2
Barrels petroleum to Baltimore.....	601,907	714,993	D. 113,086	15.8
Tons live stock carried.....	132,462	111,920	I. 20,542	18.4
Coal tonnage, Main Stem, revenue.....	1,129,387	1,069,574	I. 59,813	5.6
Coal tonnage, Main Stem, company.....	353,080	370,839	D. 17,759	4.6
Coal tonnage, Pittsburgh Div.....	1,369,061	1,138,103	I. 230,958	19.8
Coal tonnage, Trans-Ohio lines.....	216,098	293,403	D. 76,405	26.0
Total coal tonnage.....	3,063,135	2,871,919	I. 191,214	6.7

The Pittsburgh Division coal tonnage includes coke as well as coal. The report says: "The decrease in corn arose in a large degree from the fact that the rates during a portion of the year were so low, in consequence of the action of some competing lines, as to cause absolute losses, and at several periods the Baltimore & Ohio Company declined to carry this commodity at rates that were not only unremunerative, but which did not repay the actual expenses connected with its transportation. Another reason for this decrease was the diminished crop, caused by damage from protracted rains in the territory traversed by the Baltimore & Ohio road and its connections."

"The passenger earnings exhibit a decrease from \$1,364,804.38 in the preceding year to \$1,300,846.72. This reduction was caused by the decrease of travel compared with that connected with the Centennial Exhibition for October and November, 1876, the passenger revenue for those two months having been \$397,675.82, while for the corresponding months of the present year it is \$205,588.42, showing a decrease of \$192,087.40, being \$28,129.74 more than the decrease for the year."

The earnings and expenses of the various lines were as follows:

	Earnings.	Expenses.	Net earn.	Earn. P. c. of per mile, exps.
Main stem and brchs.	\$8,563,957	\$4,524,345	\$4,039,612	\$15,527 52.83
Washington branch.....	276,879	76,850	200,029	8,932 27.74
Parkersburg branch.....	650,690	473,678	176,012	6,250 71.77
Chicago Division.....	1,057,559	928,010	429,549	4,021 59.38
Cent'l Ohio Division.....	829,253	563,805	265,448	5,983 67.98
Lake Erie Division.....	657,632	423,405	234,227	5,669 64.39
Pittsburgh Division.....	1,544,022	958,592	585,430	8,874 62.07
Wheeling, Pitts. & Bal. Div.....	40,984	36,163	4,821	1,281 88.20
Newark, Somerset & Str.....	135,295	84,545	50,750	3,075 62.49
All lines.....	\$13,765,280	\$7,769,301	\$5,995,979	\$9,457 58.44

The total earnings of all lines, as compared with the previous year, were:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Gross earnings.....	\$13,765,279.90	\$13,208,860.08	L. \$556,419.81	4.1
Working expenses.....	7,769,301.36	8,236,054.87	D. 456,753.51	5.6
Net earnings.....	\$5,995,978.53	\$4,982,805.21	L. \$1,013,173.32	20.3
Per cent. of expenses.....	56.44	62.27	D.	5.83

The earnings and expenses of the main stem and branches for three years were as follows:

	1876.	1877.	1878.
Earnings.....	\$9,632,361.06	\$8,262,045.29	\$8,563,956.85
Expenses:			
General expenses.....	\$118,510.68	\$125,855.14	\$118,379.00
Losses by accidents, etc.....	\$4,910.30	\$7,185.83	\$7,960.36
Expenses of Transportation.....	2,012,500.21	1,968,747.46	1,672,086.17
Repairs of railway.....	943,743.19	808,369.21	613,302.16
Repairs of water stations.....	28,170.63	14,982.42	11,087.27
Repairs and construction of depots.....	81,286.48	80,048.84	73,522.78
Repairs and construction of telegraph lines.....	116,713.33	114,109.85	84,540.01
Repairs of stationary machinery.....	15,516.16	16,097.79	19,004.34
Watching cuts.....	22,017.85	90,380.97	80,190.17
Watching tunnels.....	50,242.19	41,306.32	43,672.68
Watching bridges.....	2,960.25	3,398.33	3,947.12
Pumping water.....	23,972.47	24,149.20	22,531.26
Repairs of locomotives.....	20,865.81	28,672.48	25,299.49
Repairs of passenger cars.....	518,421.28	496,172.89	459,649.41
Repairs of burden cars, including construction of new cars.....	259,081.73	226,781.57	198,119.58
Cleaning engines and cars.....	504,720.37	395,582.55	626,919.86
Contingent expenses of the machinery department.....	110,197.34	91,187.31	80,893.90
Fuel.....	0.275.75	5,098.86	4,688.69
Preparing fuel and filling tenders.....	377,778.18	312,334.25	275,306.01
	33,061.33	24,500.70	23,335.72
Earnings more than expenses.....	\$4,220,725.53	\$3,650,893.42	\$4,039,611.87
Working expenses.....	56.18 pr. ct.	55.73 pr. ct.	52.83 pr. ct.

It is shown that the earnings of the Main Stem and the branches stated, in comparison with the fiscal year 1877, have increased \$501,911.56, and the working expenses have decreased \$80,806.80, making a comparative increase in the net profits of \$582,718.45.

Transportation expenses of the Washington Branch are included with those of the Main Stem, only maintenance and improvements being charged against the branch earnings. The earnings of the branch showed a decrease of \$80,230.15, mainly on account of the Centennial travel of the previous year.

The net earnings of the Parkersburg Branch Railroad Company and of the Chicago Division and of the Wheeling, Pittsburgh & Baltimore Railroad Company and the excess over rental of the net earnings of the Lake Erie Division, have been credited to the accounts for interest on advances made to those companies respectively. The net earnings of the Central Ohio Division were \$24,790.54 less than the rental (35 per cent. of gross earnings) paid, and that amount was charged to profit and loss.

The Pittsburgh Division has shown a gratifying improvement, its net earnings having largely increased; they were sufficient not only to pay interest on the first mortgage, but within \$73,742.08 of the entire interest and sinking fund on the sterling loan also.

The Chicago Division also showed a great increase in net earnings. As the interest paid upon the 5 per cent. sterling loan of \$1,600,000, taken for account of this company amounted during the past year, including the premium on gold, to \$397,895.71, the line already shows its ability to pay from its net earnings more than the entire sum, exclusive of taxes. The taxes paid for these companies, \$52,189.98, being deducted from the earnings, \$429,548.39, leave \$377,358.41, which sum has been credited to the interest account of the Main Stem, in which is charged the interest and premium on gold paid for the Baltimore & Ohio & Chicago Railroad Companies' sterling 5 per cent. loan of 1927.

The lease of the Washington County Railroad expired Jan. 1, 1878, and has not been renewed. The Baltimore & Ohio Company, however, still controls the road, holding 38,464 shares of its stock. For the nine months it has been worked independently its gross earnings have been \$35,778.01. They are limited by competition with other lines.

The lines outside of the Main Stem and Washington Branch showed a gain or loss in net earnings as follows:

	Amount.	Per cent.
Parkersburg Branch, gain.....	\$70,463.68	61.0
Wheeling, Pittsburgh & Baltimore, gain.....	4,733.70	38.2
Pittsburgh Division, gain.....	161,686.74	77.8
Central Ohio Division, gain.....	116,160.42	77.8
Straitsville Division, gain.....	121.94	0.2
Chicago Division, gain.....	306,268.00	248.4
Lake Erie Division, loss.....	15,329.14	6.1
Total net gain.....	\$644,105.34	58.0

The report says: "Six hundred and twenty-four miles of track of the Main Stem are now laid with steel rails. The entire increased cost of the large quantity of steel rails thus continuously substituted for iron rails has been charged to the repair account. The economy and advantage of the substitution of steel for iron rails so generally upon the line continue to be shown by the further important reduction, which is mainly due to this change, stated by the Road Department in the cost of the 'Repairs of Railway,' of \$195,067.05.

"The condition of the entire line, its road-bed, tracks and structures has not only been fully maintained, but improved. The great regularity of its trains, and its successful working, with the absence of accidents, are noteworthy.

"The extensive and liberal arrangements heretofore made in constructing piers, docks, elevators, warehouses and all practical and economic facilities for the protection and promotion of the interests of steamships and sailing vessels, have attracted a great increase of tonnage to the port of Baltimore. The vessels entered and cleared for the year ended Sept. 30, 1878, embraced 2,315,481 tons, while for the same period of 1877 the tonnage was 1,734,670, showing an increase of 580,811 tons, equal to 33.48 per cent."

The report refers at length to the controversy between the company and the state of Maryland, and its final settlement. It says:

"In the last annual report reference was made to the litigation between the state of Maryland and the company, growing out of the claim of the former for the capitation tax of 20 per cent. on the gross receipts from passengers on

the branch road between Baltimore and Washington. This tax had been paid from the opening of the road to the amount of \$2,903,680.75 from 1856 to 1868. Upon the decision of the Superior Court of Baltimore City, on the 10th of December, 1870, which declared the tax unconstitutional, the company deducted the entire 20 per cent. from its passenger fares. Although the decision referred to was reversed by the appellate tribunals, yet there still remained an open question between the company and the state, which, if settled in favor of the former, would relieve it from the payment of the tax whether constitutional or not. Under these circumstances the company continued to give the public the advantage of the reduction in fares of 20 per cent., as adopted when the decision of the Superior Court of Baltimore City was made as to the unconstitutionality of the said tax. In the act of 1831, chapter 330, one of those under which the branch road was built, the state had reserved to itself the right to incorporate another company to build a railroad between the two cities, provided the Baltimore & Ohio Railroad Company did not complete one, with one set of tracks at least, within three years from the commencement of it. This condition having been complied with, it was maintained by the Company that thereupon the Act of 1831, ch. 330, became a contract between the state and the company, that was violated by the incorporation of the Baltimore & Potomac Railroad Company, so far as the latter was authorized by it to construct the competing road that was afterward built and which was opened for the transportation of passengers between Washington and Baltimore July 1, 1872. Accordingly, in an action instituted by the state to collect the capitation tax, this defense was taken, and in due course the case was brought before the Supreme Court of the United States on a writ of error to the Court of Appeals of Maryland, and was pending there awaiting its turn to be argued when the session of the Legislature of 1878 commenced.

"Another question between the state and the company, which was open at this time, was the claim of the latter for moneys advanced to pay the interest in London on the state's sterling bonds. Of the company's legal right here there was no doubt. It had been established in the Court of Appeals of Maryland, and in the Supreme Court of the United States.

"The company was compelled to receive legal tender from those who used its road, and the state could, therefore, in equity and justice, only ask 'out of the profits' what the company was obliged to take. But the state cannot be sued, and the company only reliance for payment of this just debt was upon the sense of right of the Legislature. Nor was this all. The relations between the state and the company were still further complicated by a claim of the former of a tax of one-half of one per cent. upon the gross earnings of the latter, which was subject to objection, as a violation of the charter exempting the Company's stock from the imposition of any tax or burden, an exemption which had, more than once been decided by the Court of Appeals, to include the franchises and property.

"It may be readily understood, therefore, that the board of directors looked with more than ordinary interest to the meeting of the Legislature of 1878, in the expectation that through its action all causes of difference between the state and the company would be adjusted, all litigation cease, all future difficulty be obviated, and those relations permanently established which were essential alike to the interests of the public and the stockholders.

"The President and directors had called the attention of the General Assembly of the state of Maryland, through their memorial, to remarkable facts in the history of the relations of the company with the state, which it hoped would lead to such examination of those relations as would insure just action on the part of the Legislature. In that memorial, after giving the particulars showing the results, the following statements were embraced:

"Thus presenting all the financial transactions of the state of Maryland with the Baltimore & Ohio Railroad Company, it is shown that a clear aggregate net gain to the state, embracing every transaction connected with the company, amounts to the vast sum of \$8,577,816.88. And thus it is conclusively shown that instead of the Baltimore & Ohio Railroad having proven a burden and a loss to the taxpayers of the state, it has directly contributed to their relief \$8,577,816.88.

"After the fullest investigation by the Legislature, the board of directors are gratified to announce that its expectation has not been disappointed—all difference between the state and the company having been amicably, satisfactorily and finally adjusted, upon terms which are fully set forth in the Act of the General Assembly, approved on the 27th of March, 1878.

"The Act of Assembly requiring their assent, a meeting of the stockholders was held on the 10th of June, 1878, and the Act received the unanimous assent of all the stockholders present at the meeting, namely: The state of Maryland, 15,186 votes; the city of Baltimore, 33,800 votes, and of the private stockholders, 63,963 votes, making a total of 112,949 shares.

Under the decision made by the Supreme Court on the 3d of May, 1875, the company paid to the State Treasurer for the capitation tax, from January, 1868, up to January 1, 1870, the sum of \$424,229.81. Under the provisions of the Act of 1878, five dividends on the Washington Branch, which, as mentioned in the previous annual reports, were suspended during the pending litigation, have been declared of which the state's proportion was \$187,500, namely, 25 per cent. for the 30 months ended September 30, 1877. The Baltimore & Ohio Company also paid the state in cash the sum of \$100,540.64, being for taxes from the 1st of April, 1872.

"In section 4 of the said Act it was enacted: 'That the sum of \$968,370.56 shall be deemed and taken to be the whole sum due by Baltimore & Ohio Railroad Company to the state of Maryland to the first day of January, in the year 1878, for the state's proportion of the whole amount of money received by the said Baltimore & Ohio Railroad Company for the transportation of passengers on its railroad between Baltimore and Washington, or any part of its railroad between Baltimore and Washington, and for all dividends upon the state's stock in the Washington Branch Railroad up to October, in the year 1877, after crediting to the said Baltimore & Ohio Railroad Company all claims of every description whatsoever of said company against the said state of Maryland.'

"This sum was fixed on the following basis, namely:

Capitation tax from 1st January, 1870, to July 1, 1872, at which date the Baltimore & Potomac road was opened between Baltimore and Washington.....	\$943,875.32
Capitation tax from July 1, 1872, to July 1, 1873, at which date the Baltimore & Potomac road was opened for through business between Washington, Philadelphia, and the North.....	134,588.54
Making for capitation tax.....	\$478,433.86
Dividends on Washington Branch, viz: 25 per cent. for the 30 months ended Sept. 30, 1877.....	137,500.00
Total.....	\$615,933.86
Less allowance for the principal of the gold claim, which was due by average Feb. 3, 1862.....	249,563.30
Balance as stated in said Act.....	\$366,370.56

"Under this arrangement the capitation tax was paid from Dec. 10, 1870, to July 1, 1873, during which period the deduction of the whole 20 per cent. had been made to the public. Thus the company, having deducted 20 per cent. from its charges to the public and paid to the state 20 per cent. also, the amount of difference was equivalent to 40 per cent. upon its gross revenue, on the basis of its former rates for passengers, during the said period. It will be seen that under this agreement the interest due the Main Stem by the state of Maryland, amounting to \$170,867.66 on the gold claim of \$249,563.30, namely, for the period during which the advances were made, was abated by the company.

The settlement was made in accordance with the terms stated, and bonds for \$366,000, payable at ten years from July 1, 1878, with interest at 6 per cent., payable semi-annually, were issued, and the said bonds now appear in the statement of the liabilities of the Baltimore & Ohio Company.

"As the amount due from the state of Maryland for the gold claim had not heretofore been placed among the assets of the company, the sum thus credited by the state of Maryland in this settlement, namely, \$249,563.30, is entered as a credit to the profit and loss account for the fiscal year.

"Under this Act, in consideration of the release of the capitation tax on the Washington Branch road from the 1st of July, 1873, the company agreed to modify its exemption from taxation under its original charter, so far as to submit its franchises and property and gross receipts within the state of Maryland to a tax of one-half of one per cent. per annum upon its gross receipts within the state of Maryland, the state stipulating that no further or greater state tax or burden shall ever be imposed thereon.

"The final adjustment of all controversies between the company and the state, upon terms 'deemed to be just and proper as an equitable settlement,' and the restoration of cordial and cooperative relations with the state of Maryland, are proper subjects of general congratulation and satisfaction."

Mobile & Girard.

This company owns a line from Columbus, Ga., to Troy, Ala., 84 miles. Its latest report is for the year ending May 31, 1878.

The general account is as follows:

Stock (\$15,226 per mile).....	\$1,278,940
Bonds (\$13,898 per mile).....	1,133,500
Due Central R. R. of Georgia.....	5,684
Total (\$28,787 per mile).....	\$2,418,124
Construction, etc. (\$23,932 per mile).....	\$2,010,310
Profit and loss.....	389,062
Cash and balances.....	18,752
	2,418,124

The earnings and expenses for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passage.....	\$33,031	\$31,762	L. \$1,269	4.0
Freight.....	130,077	117,604	L. 12,473	18.3
Mails.....	3,464	3,530	D. 66	1.9
Total.....	\$176,572	\$352,896	L. \$22,670	14.8
Expenses.....	112,274	97,633	L. 14,641	15.0
Net earnings.....	\$63,298	\$55,263	L. \$8,035	14.5
Gross earn. per mile.....	2.060	1.820	L. .240	13.8
Net.....	.754	.658	L. .096	14.5
Per cent. of expenses.....	63.94	63.81	L. .013	0.2

The increase in expenses was due to large renewals, which included 6½ miles of new rails, several bridges rebuilt and extensive repairs to equipment.

The report says: "This is a considerable improvement over the previous year, especially if we take into account the fact that the renewal of rails has been considerably more than for any previous year since the existence of the road. The rolling stock and bridges have also been very much improved—all of which has been charged to expenses.

"In the last annual report a very full statement was made of a scheme for reducing the interest upon the indebtedness of the company. This plan has been carried out so far as to exchange \$800,000 of the company's 4 per cent. bonds, with the Central Railroad & Banking Company of Georgia, for a like amount of this company's first mortgage bonds, and the coupons which had been taken up by that company. Of the \$38,500 plain 8 per cent. bonds outstanding at the date of the last report, \$33,000 have been taken up and canceled by exchange for a like amount of 6 per cent. bonds, thus reducing our interest account from \$91,202 to \$57,980 per annum, leaving one plain bond of \$500 yet outstanding to be adjusted whenever it is presented.

"The \$300,000 8 per cent. bonds will mature Jan. 1, 1880, and, with reasonable prosperity, it is believed that the company will be able to meet them at maturity, with the use only of the \$167,000 6 per cent. bonds now in the hands of H. H. Epping, Esq., Trustee. If this can be done, the annual interest will then amount to only \$44,000 per annum, and it is not unreasonable to expect that small dividends can thereafter be paid from the earnings of the road."

Davenport & Northwestern.

This company owns a line from Davenport, Ia., north by west to Fayette, 128.40 miles, with a branch from Eldridge to Maquoketa, 32.25 miles, making 160.65 miles in all, with 8.55 miles of sidings. The report is for the year ending June 30, 1878.

The equipment consists of 8 locomotives; 7 passenger, 2 smoking and 3 baggage cars; 49 box, 10 stock, 26 flat, 15 coal and 2 caboose cars.

The stock and debt of the present company, which acquired the road in 1876, through foreclosure, is as follows:

Stock (\$21,925 per mile).....	\$3,520,000
Bonds (\$10,651 per mile).....	1,710,000
Other debt.....	196,827
Total (\$33,801 per mile).....	\$5,426,827

During the year trains ran 187,487 miles, carrying 81,582 passengers and 67,043 tons of freight, of which 30,894 tons were through, and 36,209 tons local freight. The earnings for the year were as follows:

Passengers.....	\$70,146.81
Freight.....	143,272.77
Express, mail, etc.....	9,307.89
Total (\$1,386.06 per mile).....	\$222,727.47
Working expenses.....	\$184,430.32
Extraordinary expenses.....	20,458.36
	204,888.68
Net earnings (\$110.49 per mile).....	\$17,738.59

The working expenses were 82.85 per cent., and the total expenses 92.04 per cent. of gross earnings. The net earnings were 1.04 per cent. on the bonds.

No accident occurred during the year, and no injury was done to passengers or employees.

Like most of the roads similarly situated in Iowa the traffic of the road is very light. It depends entirely upon the country on its line, and its traffic and rates are limited by the lines which it intersects.